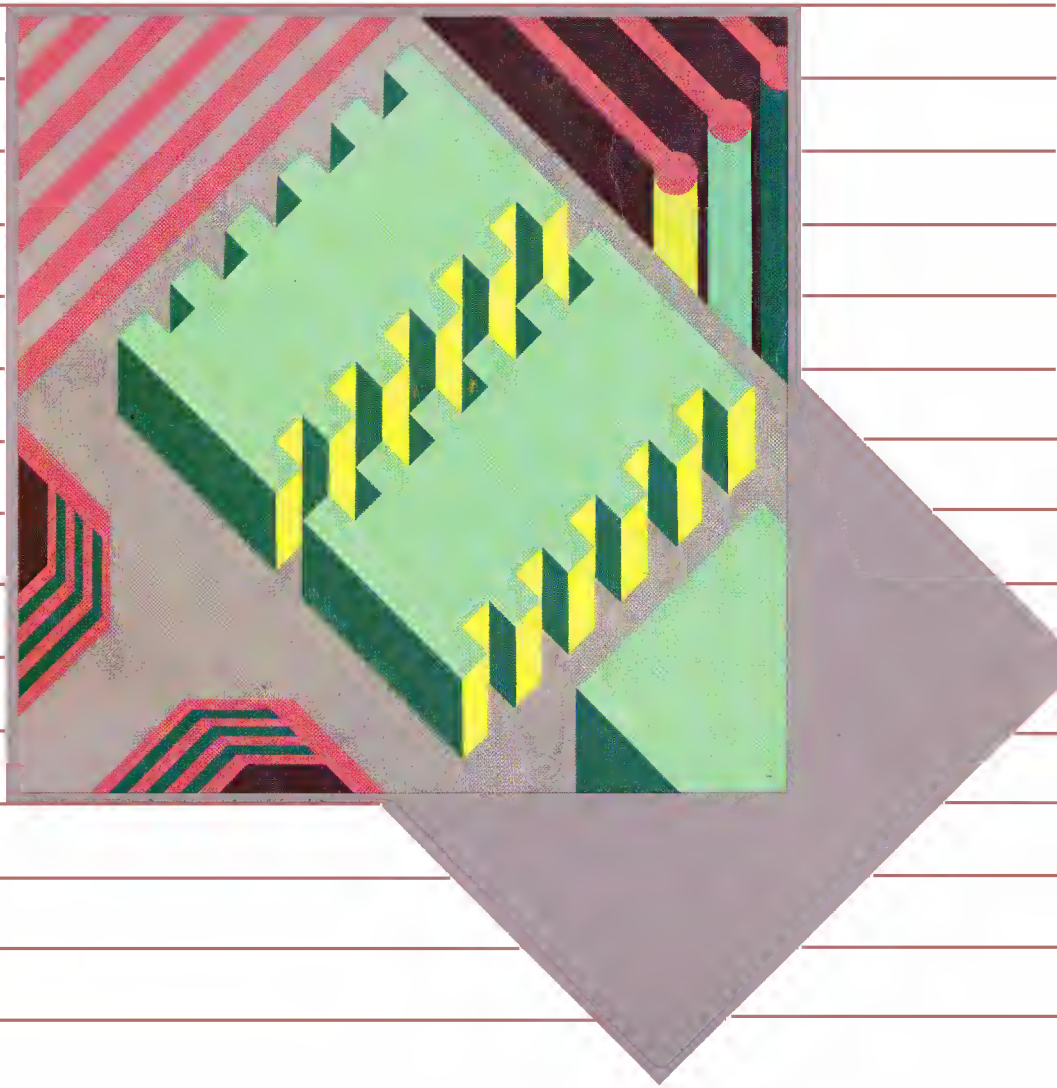
Apple *II*

Reference Manual Addendum: Monitor ROM Listings

For *IIe* Only



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Warning

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Apple *IIe*

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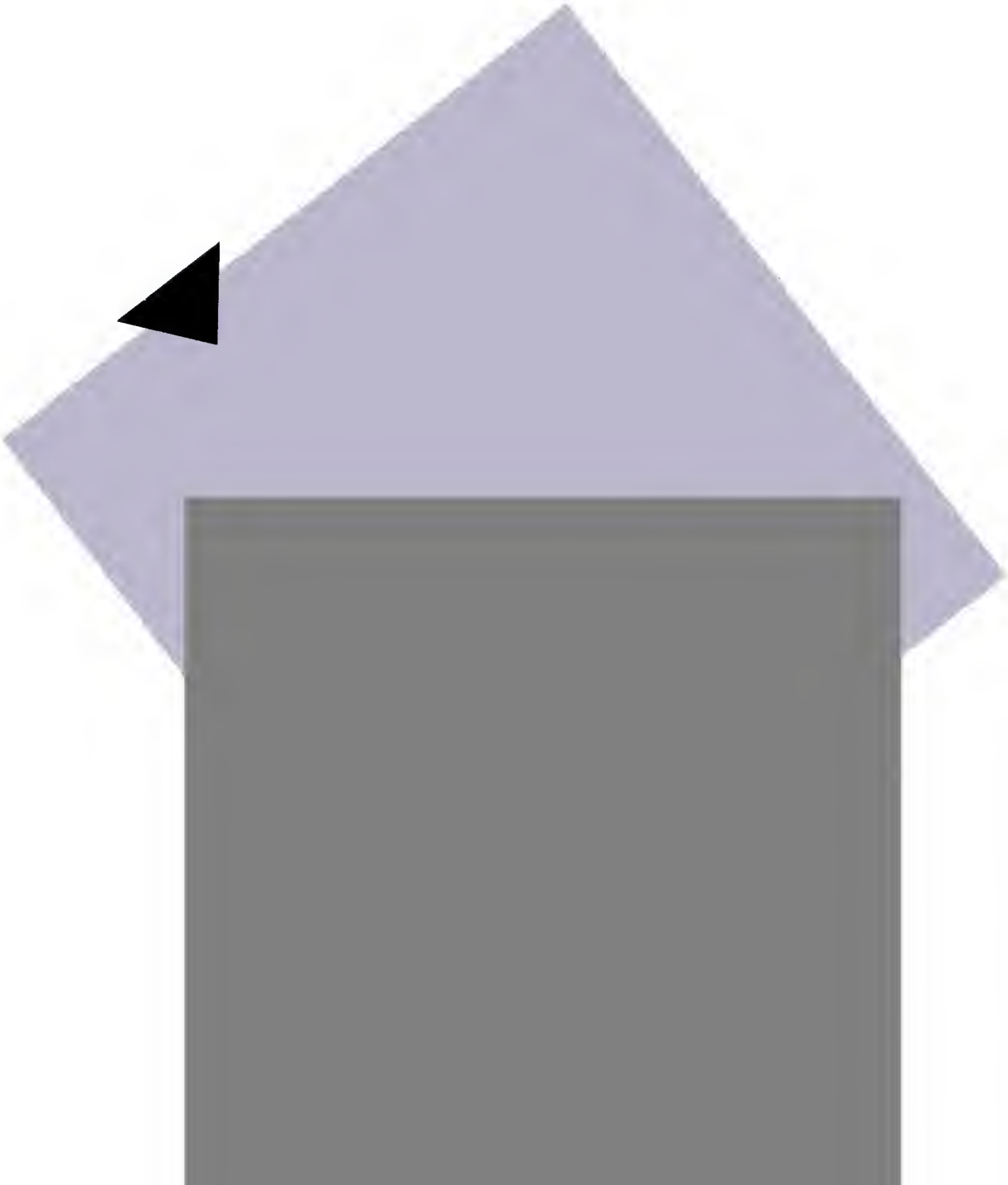

Radio and Television Interference

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J, Part 15, of FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if you use a "rabbit ear" television antenna. (A "rabbit ear" antenna is the telescoping-rod type usually contained on TV receivers.)

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripheral devices. To further isolate the problem:

- Disconnect the peripheral devices and their input/output cables one at a time. If the interference stops, it is caused by either the peripheral device or its I/O cable. These devices usually require shielded I/O cables. For Apple peripheral devices, you can obtain the proper shielded cable from your dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

If your computer does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

- Turn the TV or radio antenna until the interference stops.
- Move the computer to one side or the other of the TV or radio.
- Move the computer farther away from the TV or radio.
- Plug the computer into an outlet that is on a different circuit than the TV or radio. (That is, make certain the computer and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet, prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, stock number 004-000-00345-4.

Table of Contents

3 Monitor ROM Listings

Monitor Firmware Listing

```
0000:                2 ********************************
0000:                3 *
0000:                4 * APPLE II
0000:                5 * MONITOR II
0000:                6 *
0000:                7 * COPYRIGHT 1978 BY
0000:                8 * APPLE COMPUTER, INC.
0000.                9 *
0000.               10 * ALL RIGHTS RESERVED
0000:               11 *
0000.               12 * STEVE WOZNIAK
0000.               13 *
0000:               14 ********************************
0000:               15 *
0000.               16 * MODIFIED NOV 1978
0000:               17 * BY JOHN A
0000.               18 *
0000:               19 * MODIFIED SEP 1981
0000:               20 * BY RICK AURICCHIO
0000:               21 *    & BRYAN STEARNS
0000:               22 *    FOR APPLE2E 80COLS
0000:               23 *
0000:               24 * CHANGES MARKED BY 'RRA0981'
0000.               25 *
0000:        0001   26 APPLE2E     EQU   1            ;COND ASSM/RRA0981
0000:               27 *
0000.               28 ********************************
------ NEXT OBJECT FILE NAME IS BJS.SRC1.OBJ0
F800.        F800   29               ORG   $F800
F800:        0000   30               OBJ   $2000
F800:               31 ********************************
F800.        0000   32 LOC0          EQU   $00
F800.        0001   33 LOC1          EQU   $01
F800:        0020   34 WNDLFT        EQU   $20
F800         0021   35 WNDWDTH       EQU   $21
F800.        0022   36 WNDTOP        EQU   $22
F800.        0023   37 WNDBTM        EQU   $23
F800         0024   38 CH            EQU   $24
F800.        0025   39 CV            EQU   $25
F800:        0026   40 GBASL         EQU   $26
F800         0027   41 GBASH         EQU   $27
F800.        0028   42 BASL          EQU   $28
F800         0029   43 BASH          EQU   $29
F800:        002A   44 BAS2L         EQU   $2A
F800:        002B   45 BAS2H         EQU   $2B
F800.        002C   46 H2            EQU   $2C
F800         002C   47 LMNEM         EQU   $2C
F800         002D   48 V2            EQU   $2D
F800         002D   49 RMNEM         EQU   $2D
F800         002E   50 MASK          EQU   $2E
F800         002E   51 CHKSUM        EQU   $2E
F800         002E   52 FORMAT        EQU   $2E
F800         002F   53 LASTIN        EQU   $2F
F800         002F   54 LENGTH        EQU   $2F
F800         002F   55 SIGN          EQU   $2F
F800         0030   56 COLOR         EQU   $30
F800         0031   57 MODE          EQU   $31
F800         0032   58 INVFLG        EQU   $32
F800         0033   59 PROMPT        EQU   $33
F800         0034   60 YSAV          EQU   $34
F800         0035   61 YSAV1         EQU   $35
F800         0036   62 CSWL          EQU   $36
F800         0037   63 CSWH          EQU   $37
F800         0038   64 KSWL          EQU   $38
F800         0039   65 KSWH          EQU   $39
F800         003A   66 PCL           EQU   $3A
F800         003B   67 PCH           EQU   $3B
F800         003C   68 A1L           EQU   $3C
F800         003D   69 A1H           EQU   $3D
F800         003E   70 A2L           EQU   $3E
F800         003F   71 A2H           EQU   $3F
F800         0040   72 A3L           EQU   $40
F800         0041   73 A3H           EQU   $41
F800         0042   74 A4L           EQU   $42
F800         0043   75 A4H           EQU   $43
F800         0044   76 A5L           EQU   $44
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F800:          0045   77 A5H          EQU   $45
F800:          0045   78 ACC          EQU   $45          ; NOTE OVERLAP WITH A5H'
F800:          0046   79 XREG         EQU   $46
F800:          0047   80 YREG         EQU   $47
F800:          0048   81 STATUS       EQU   $48
F800:          0049   82 SPNT         EQU   $49
F800:          004E   83 RNDL         EQU   $4E
F800           004F   84 RNDH         EQU   $4F
F800:          0095   85 PICK         EQU   $95
F800:          0200   86 IN           EQU   $0200
F800:          03F0   87 BRKV         EQU   $3F0         ; NEW VECTOR FOR BRK
F800           03F2   88 SOFTEV       EQU   $3F2         ; VECTOR FOR WARM START
F800:          03F4   89 PWREDUP      EQU   $3F4         ; THIS MUST = EOR #$A5 OF SOFTEV+1
F800           03F5   90 AMPERV       EQU   $3F5         ; APPLESOFT & EXIT VECTOR
F800           03F8   91 USRADR       EQU   $03F8
F800           03FB   92 NMI          EQU   $03FB
F800:          03FE   93 IRQLOC       EQU   $3FE
F800           0400   94 LINE1        EQU   $400
F800:          07F8   95 MSLOT        EQU   $07F8
F800           C000   96 IOADR        EQU   $C000
F800:          C000   97 KBD          EQU   $C000
F800           C010   98 KBDSTRB      EQU   $C010
F800           C020   99 TAPEOUT      EQU   $C020
F800:          C030  100 SPKR         EQU   $C030
F800:          C050  101 TXTCLR       EQU   $C050
F800           C051  102 TXTSET       EQU   $C051
F800           C052  103 MIXCLR       EQU   $C052
F800:          C053  104 MIXSET       EQU   $C053
F800           C054  105 LOWSCR       EQU   $C054
F800           C055  106 HISCR        EQU   $C055
F800           C056  107 LORES        EQU   $C056
F800:          C057  108 HIRES        EQU   $C057
F800           C058  109 SETANO       EQU   $C058
F800           C059  110 CLRANO       EQU   $C059
F800:          C05A  111 SETAN1       EQU   $C05A
F800           C05B  112 CLRAN1       EQU   $C05B
F800           C05C  113 SETAN2       EQU   $C05C
F800           C05D  114 CLRAN2       EQU   $C05D
F800:          C05E  115 SETAN3       EQU   $C05E
F800           C05F  116 CLRAN3       EQU   $C05F
F800           C060  117 TAPEIN       EQU   $C060
F800           C064  118 PADDLO       EQU   $C064
F800           C070  119 PTRIG        EQU   $C070
F800           CFFF  120 CLRROM       EQU   $CFFF
F800:          E000  121 BASIC        EQU   $E000
F800:          E003  122 BASIC2       EQU   $E003
F800:4A              123 PLOT         LSR   A            ;Y-COORD/2
F801:08              124              PHP                ;SAVE LSB IN CARRY
F802:20 47 F8        125              JSR   GBASCALC     ;CALC BASE ADR IN GBASL,H
F805:28              126              PLP                ;RESTORE LSB FROM CARRY
F806:A9 0F           127              LDA   #$0F         ;MASK $0F IF EVEN
F808:90 02    F80C   128              BCC   RTMASK
F80A:69 E0           129              ADC   #$E0         ;MASK $F0 IF ODD
F80C:85 2E           130 RTMASK       STA   MASK
F80E:B1 26           131 PLOT1        LDA   (GBASL),Y    ;DATA
F810:45 30           132              EOR   COLOR        ;  XOR COLOR
F812:25 2E           133              AND   MASK         ;   AND MASK
F814:51 26           134              EOR   (GBASL),Y    ;    XOR DATA
F816:91 26           135              STA   (GBASL),Y    ;     TO DATA
F818:60              136              RTS
F819:20 00 F8        137 HLINE        JSR   PLOT         ;PLOT SQUARE
F81C:C4 2C           138 HLINE1       CPY   H2           ;DONE?
F81E:B0 11    F831   139              BCS   RTS1         ;  YES, RETURN
F820:C8              140              INY                ;  NO, INCR INDEX (X-COORD)
F821:20 0E F8        141              JSR   PLOT1        ;PLOT NEXT SQUARE
F824:90 F6    F81C   142              BCC   HLINE1       ;ALWAYS TAKEN
F826:69 01           143 VLINEZ       ADC   #$01         ;NEXT Y-COORD
F828:48              144 VLINE        PHA                ;  SAVE ON STACK
F829:20 00 F8        145              JSR   PLOT         ;  PLOT SQUARE
F82C:68              146              PLA
F82D:C5 2D           147              CMP   V2           ;DONE?
F82F:90 F5    F826   148              BCC   VLINEZ       ;  NO, LOOP
F831:60              149 RTS1         RTS
F832:A0 2F           150 CLRSCR       LDY   #$2F         ;MAX Y, FULL SCRN CLR
F834:D0 02    F838   151              BNE   CLRSC2       ;ALWAYS TAKEN
F836:A0 27           152 CLR1OP       LDY   #$27         ;MAX Y, TOP SCRN CLR
F838:84 2D           153 CLRSC2       STY   V2           ;STORE AS BOTTOM COORD
F83A                 154                                 FOR VLINE CALLS
F83A:A0 27           155              LDY   #$27         ;RIGHTMOST X-COORD (COLUMN)
F83C:A9 00           156 CLRSC3       LDA   #$00         ;TOP COORD FOR VLINE CALLS
F83E:85 30           157              STA   COLOR        ;CLEAR COLOR (BLACK)
F840:20 28 F8        158              JSR   VLINE        ;DRAW VLINE
F843:88              159              DEY                ;NEXT LEFTMOST X-COORD
F844:10 F6    F83C   160              BPL   CLRSC3       ;LOOP UNTIL DONE
F846:60              161              RTS
F847:48              162 GBASCALC     PHA                ;FOR INPUT  OODEFGH
F848:4A              163              LSR   A
F849:29 03           164              AND   #$03
F84B:09 04           165              ORA   #$04         ;GENERATE GBASH=000001FG
F84D:85 27           166              STA   GBASH
F84F:68              167              PLA                ;AND GBASL=HDEDE000
F850:29 18           168              AND   #$18
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F852:90 02   F856  169             BCC   GBCALC
F854:69 7F         170             ADC   #$7F
F856:85 26         171 GBCALC      STA   GBASL
F858:0A            172             ASL   A
F859:0A            173             ASL   A
F85A:05 26         174             ORA   GBASL
F85C:85 26         175             STA   GBASL
F85E:60            176             RTS
F85F:A5 30         177 NXTCOL      LDA   COLOR         ;INCREMENT COLOR BY 3
F861:18            178             CLC
F862:69 03         179             ADC   #$03
F864:29 0F         180 SETCOL      AND   #$0F          ;SETS COLOR=17*A MOD 16
F866:85 30         181             STA   COLOR
F868:0A            182             ASL   A             ;BOTH HALF BYTES OF COLOR EQUAL
F869:0A            183             ASL   A
F86A:0A            184             ASL   A
F86B:0A            185             ASL   A
F86C:05 30         186             ORA   COLOR
F86E:85 30         187             STA   COLOR
F870:60            188             RTS
F871:4A            189 SCRN        LSR   A             ;READ SCREEN Y-COORD/2
F872:08            190             PHP                 ;SAVE LSB (CARRY)
F873:20 47 F8      191             JSR   GBASCALC      ;CALC BASE ADDRESS
F876:B1 26         192             LDA   (GBASL),Y     ;GET BYTE
F878:28            193             PLP                 ;RESTORE LSB FROM CARRY
F879:90 04   F87F  194 SCRN2       BCC   RTMSKZ        ;IF EVEN, USE LO H
F87B:4A            195             LSR   A
F87C:4A            196             LSR   A
F87D:4A            197             LSR   A             ;SHIFT HIGH HALF BYTE DOWN
F87E:4A            198             LSR   A
F87F:29 0F         199 RTMSKZ      AND   #$0F          ;MASK 4-BITS
F881:60            200             RTS
F882:A6 3A         201 INSDS1      LDX   PCL           ;PRINT PCL,H
F884:A4 3B         202             LDY   PCH
F886:20 96 FD      203             JSR   PRYX2
F889:20 48 F9      204             JSR   PRBLNK        ;FOLLOWED BY A BLANK
F88C:A1 3A         205 INSOS2      LDA   (PCL,X)       ;GET OPCODE
F88E:A8            206             TAY
F88F:4A            207             LSR   A             ;EVEN/ODD TEST
F890:90 09   F898  208             BCC   IEVEN
F892:6A            209             ROR   A             ;BIT 1 TEST
F893:B0 10   F8A5  210             BCS   ERR           ;XXXXXX11 INVALID OP
F895:C9 A2         211             CMP   #$A2
F897:F0 0C   F8A5  212             BEQ   ERR           ;OPCODE $89 INVALID
F899:29 87         213             AND   #$87          ;MASK BITS
F89B:4A            214 IEVEN       LSR   A             ;LSB INTO CARRY FOR L/R TEST
F89C:AA            215             TAX
F89D:BD 62 F9      216             LDA   FMT1,X        ;GET FORMAT INDEX BYTE
F8A0:20 79 F8      217             JSR   SCRN2         ;R/L H-BYTE ON CARRY
F8A3:D0 04   F8A9  218             BNE   GETFMT
F8A5:A0 80         219 ERR         LDY   #$80          ;SUBSTITUTE $80 FOR INVALID OPS
F8A7:A9 00         220             LDA   #$00          ;SET PRINT FORMAT INDEX TO 0
F8A9:AA            221 GETFMT      TAX
F8AA:BD A6 F9      222             LDA   FMT2,X        ;INDEX INTO PRINT FORMAT TABLE
F8AD:85 2E         223             STA   FORMAT        ;SAVE FOR ADR FIELD FORMATTING
F8AF:29 03         224             AND   #$03          ;MASK FOR 2-BIT LENGTH
F8B1:              225 ; (0=1 BYTE, 1=2 BYTE, 2=3 BYTE)
F8B1:85 2F         226             STA   LENGTH
F8B3:98            227             TYA                 ;OPCODE
F8B4:29 8F         228             AND   #$8F          ;MASK FOR 1XXX1010 TEST
F8B6:AA            229             TAX                 ; SAVE IT
F8B7:98            230             TYA                 ;OPCODE TO A AGAIN
F8B8:A0 03         231             LDY   #$03
F8BA:E0 8A         232             CPX   #$8A
F8BC:F0 0B   F8C9  233             BEQ   MNNDX3
F8BE:4A            234 MNNDX1      LSR   A
F8BF:90 08   F8C9  235             BCC   MNNDX3        ;FORM INDEX INTO MNEMONIC TABLE
F8C1:4A            236             LSR   A
F8C2:4A            237 MNNDX2      LSR   A             ;  1) 1XXX1010 => 00101XXX
F8C3:09 20         238             ORA   #$20          ;  2) XXXYYY01 => 00111XXX
F8C5:88            239             DEY                 ;  3) XXXYYY10 => 00110XXX
F8C6:D0 FA   F8C2  240             BNE   MNNDX2        ;  4) XXXYY100 => 00100XXX
F8C8:C8            241             INY                 ;  5) XXXXX000 => 000XXXXX
F8C9:88            242 MNNDX3      DEY
F8CA:D0 F2   F8BE  243             BNE   MNNDX1
F8CC:60            244             RTS
F8CD:FF FF FF      245             DFB   $FF,$FF,$FF
F8D0:20 82 F8      246 INSTDSP     JSR   INSDS1        ;GEN FMT, LEN BYTES
F8D3:48            247             PHA                 ;SAVE MNEMONIC TABLE INDEX
F8D4:B1 3A         248 PRNTOP      LDA   (PCL),Y
F8D6:20 DA FD      249             JSR   PRBYTE
F8D9:A2 01         250             LDX   #$01          ;PRINT 2 BLANKS
F8DB:20 4A F9      251 PRNTBL      JSR   PRBL2
F8DE:C4 2F         252             CPY   LENGTH        ;PRINT INST (1-3 BYTES)
F8E0:C8            253             INY                 ;IN A 12 CHR FIELD
F8E1:90 F1   F8D4  254             BCC   PRNTOP
F8E3:A2 03         255             LDX   #$03          ;CHAR COUNT FOR MNEMONIC INDEX
F8E5:C0 04         256             CPY   #$04
F8E7:90 F2   F8DB  257             BCC   PRNTBL
F8E9:68            258             PLA                 ;RECOVER MNEMONIC INDEX
F8EA:A8            259             TAY
F8EB:B9 C0 F9      260             LDA   MNEML,Y
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```
F8EE- 85 2C        261              STA   LMNEM        ;FETCH 3-CHAR MNEMONIC
F8F0- B9 00 FA     262              LDA   MNEMR,Y      ;   (PACKED INTO 2-BYTES)
F8F3- 85 2D        263              STA   RMNEM
F8F5- A9 00        264 PRMN1        LDA   #$00
F8F7- A0 05        265              LDY   #$05
F8F9- 06 2D        266 PRMN2        ASL   RMNEM        ;SHIFT 5 BITS OF CHARACTER INTO A
F8FB- 26 2C        267              ROL   LMNEM
F8FD- 2A           268              ROL   A            ;   (CLEARS CARRY)
F8FE- 88           269              DEY
F8FF- D0 F8   F8F9 270              BNE   PRMN2
F901- 69 BF        271              ADC   #$BF         ;ADD "?" OFFSET
F903- 20 ED FD     272              JSR   COUT         ;OUTPUT A CHAR OF MNEM
F906- CA           273              DEX
F907- D0 EC   F8F5 274              BNE   PRMN1
F909- 20 48 F9     275              JSR   PRBLNK       ;OUTPUT 3 BLANKS
F90C- A4 2F        276              LDY   LENGTH
F90E- A2 06        277              LDX   #$06         ;CNT FOR 6 FORMAT BITS
F910- E0 03        278 PRADR1       CPX   #$03
F912- F0 1C   F930 279              BEQ   PRADR5       ;IF X=3 THEN ADDR
F914- 06 2E        280 PRADR2       ASL   FORMAT
F916- 90 0E   F926 281              BCC   PRADR3
F918- BD B3 F9     282              LDA   CHAR1-1,X
F91B- 20 ED FD     283              JSR   COUT
F91E- BD B9 F9     284              LDA   CHAR2-1,X
F921- F0 03   F926 285              BEQ   PRADR3
F923- 20 ED FD     286              JSR   COUT
F926- CA           287 PRADR3       DEX
F927- D0 E7   F910 288              BNE   PRADR1
F929- 60           289              RTS
F92A- 88           290 PRADR4       DEY
F92B- 30 E7   F914 291              BMI   PRADR2
F92D- 20 DA FD     292              JSR   PRBYTE
F930- A5 2E        293 PRADR5       LDA   FORMAT
F932- C9 E8        294              CMP   #$E8         ;HANDLE REL ADR MODE
F934- B1 3A        295              LDA   (PCL),Y      ;SPECIAL (PRINT TARGET,
F936- 90 F2   F92A 296              BCC   PRADR4       ;  NOT OFFSET)
F938- 20 56 F9     297 RELADR       JSR   PCADJ3
F93B- AA           298              TAX                ;PCL,PCH+OFFSET+1 TO A,Y
F93C- E8           299              INX
F93D- D0 01   F940 300              BNE   PRNTYX       ;+1 TO Y,X
F93F- C8           301              INY
F940- 98           302 PRNTYX       TYA
F941- 20 DA FD     303 PRNTAX       JSR   PRBYTE       ;OUTPUT TARGET ADR
F944- 8A           304 PRNTX        TXA                ;  OF BRANCH AND RETURN
F945- 4C DA FD     305              JMP   PRBYTE
F948- A2 03        306 PRBLNK       LDX   #$03         ;BLANK COUNT
F94A- A9 A0        307 PRBL2        LDA   #$A0         ;LOAD A SPACE
F94C- 20 ED FD     308 PRBL3        JSR   COUT         ;OUTPUT A BLANK
F94F- CA           309              DEX
F950- D0 F8   F94A 310              BNE   PRBL2        ;LOOP UNTIL COUNT=0
F952- 60           311              RTS
F953- 38           312 PCADJ        SEC                ;0=1 BYTE, 1=2 BYTE,
F954- A5 2F        313 PCADJ2       LDA   LENGTH       ;  2=3 BYTE
F956- A4 3B        314 PCADJ3       LDY   PCH
F958- AA           315              TAX                ;TEST DISPLACEMENT SIGN
F959- 10 01   F95C 316              BPL   PCADJ4       ;  (FOR REL BRANCH)
F95B- 88           317              DEY                ;EXTEND NEG BY DECR PCH
F95C- 65 3A        318 PCADJ4       ADC   PCL
F95E- 90 01   F961 319              BCC   RTS2         ;PCL+LENGTH(OR DISPL)+1 TO A
F960- C8           320              INY                ;  CARRY INTO Y (PCH)
F961- 60           321 RTS2         RTS
F962:              322 ; FMT1 BYTES:    XXXXXXYO INSTRS
F962:              323 ; IF Y=0         THEN LEFT HALF BYTE
F962:              324 ; IF Y=1         THEN RIGHT HALF BYTE
F962:              325 ;                  (X=INDEX)
F962- 04           326 FMT1         DFB   $04
F963- 20           327              DFB   $20
F964- 54           328              DFB   $54
F965- 30           329              DFB   $30
F966- 0D           330              DFB   $0D
F967- 80           331              DFB   $80
F968- 04           332              DFB   $04
F969- 90           333              DFB   $90
F96A- 03           334              DFB   $03
F96B- 22           335              DFB   $22
F96C- 54           336              DFB   $54
F96D- 33           337              DFB   $33
F96E- 0D           338              DFB   $0D
F96F- 80           339              DFB   $80
F970- 04           340              DFB   $04
F971- 90           341              DFB   $90
F972- 04           342              DFB   $04
F973- 20           343              DFB   $20
F974- 54           344              DFB   $54
F975- 33           345              DFB   $33
F976- 0D           346              DFB   $0D
F977- 80           347              DFB   $80
F978- 04           348              DFB   $04
F979- 90           349              DFB   $90
F97A- 04           350              DFB   $04
F97B- 20           351              DFB   $20
F97C- 54           352              DFB   $54
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F97D: 3B            353              DFB   $3B
F97E: 0D            354              DFB   $0D
F97F: 80            355              DFB   $80
F980: 04            356              DFB   $04
F981: 90            357              DFB   $90
F982: 00            358              DFB   $00
F983: 22            359              DFB   $22
F984: 44            360              DFB   $44
F985: 33            361              DFB   $33
F986: 0D            362              DFB   $0D
F987: C8            363              DFB   $C8
F988: 44            364              DFB   $44
F989: 00            365              DFB   $00
F98A: 11            366              DFB   $11
F98B: 22            367              DFB   $22
F98C: 44            368              DFB   $44
F98D: 33            369              DFB   $33
F98E: 0D            370              DFB   $0D
F98F: C8            371              DFB   $C8
F990: 44            372              DFB   $44
F991: A9            373              DFB   $A9
F992: 01            374              DFB   $01
F993: 22            375              DFB   $22
F994: 44            376              DFB   $44
F995: 33            377              DFB   $33
F996: 0D            378              DFB   $0D
F997: 80            379              DFB   $80
F998: 04            380              DFB   $04
F999: 90            381              DFB   $90
F99A: 01            382              DFB   $01
F99B: 22            383              DFB   $22
F99C: 44            384              DFB   $44
F99D: 33            385              DFB   $33
F99E: 0D            386              DFB   $0D
F99F: 80            387              DFB   $80
F9A0: 04            388              DFB   $04
F9A1: 90            389              DFB   $90
F9A2: 26            390              DFB   $26
F9A3: 31            391              DFB   $31
F9A4: 87            392              DFB   $87
F9A5: 9A            393              DFB   $9A
F9A6:               394 ; ZZXXXY01 INSTR'S
F9A6: 00            395 FMT2         DFB   $00          ;ERR
F9A7: 21            396              DFB   $21          ;IMM
F9A8: 81            397              DFB   $81          ;Z-PAGE
F9A9: 82            398              DFB   $82          ;ABS
F9AA: 00            399              DFB   $00          ;IMPLIED
F9AB: 00            400              DFB   $00          ;ACCUMULATOR
F9AC: 59            401              DFB   $59          ;(ZPAG,X)
F9AD: 4D            402              DFB   $4D          ;(ZPAG),Y
F9AE: 91            403              DFB   $91          ;ZPAG,X
F9AF: 92            404              DFB   $92          ;ABS,X
F9B0: 86            405              DFB   $86          ;ABS,Y
F9B1: 4A            406              DFB   $4A          ;(ABS)
F9B2: 85            407              DFB   $85          ;ZPAG,Y
F9B3: 9D            408              DFB   $9D          ;RELATIVE
F9B4: AC            409 CHAR1        DFB   $AC          ;','
F9B5: A9            410              DFB   $A9          ;')'
F9B6: AC            411              DFB   $AC          ;','
F9B7: A3            412              DFB   $A3          ;'#'
F9B8: A8            413              DFB   $A8          ;'('
F9B9: A4            414              DFB   $A4          ;'$'
F9BA: D9            415 CHAR2        DFB   $D9          ;'Y'
F9BB: 00            416              DFB   $00
F9BC: DB            417              DFB   $DB          ;'Y'
F9BD: A4            418              DFB   $A4          ;'$'
F9BE: A4            419              DFB   $A4          ;'$'
F9BF: 00            420              DFB   $00
F9C0: 1C            421 MNEML        DFB   $1C
F9C1: 8A            422              DFB   $8A
F9C2: 1C            423              DFB   $1C
F9C3: 23            424              DFB   $23
F9C4: 5D            425              DFB   $5D
F9C5: 8B            426              DFB   $8B
F9C6: 1B            427              DFB   $1B
F9C7: A1            428              DFB   $A1
F9C8: 9D            429              DFB   $9D
F9C9: 8A            430              DFB   $8A
F9CA: 1D            431              DFB   $1D
F9CB: 23            432              DFB   $23
F9CC: 9D            433              DFB   $9D
F9CD: 8B            434              DFB   $8B
F9CE: 1D            435              DFB   $1D
F9CF: A1            436              DFB   $A1
F9D0: 00            437              DFB   $00
F9D1: 29            438              DFB   $29
F9D2: 19            439              DFB   $19
F9D3: AE            440              DFB   $AE
F9D4: 69            441              DFB   $69
F9D5: A8            442              DFB   $A8
F9D6: 19            443              DFB   $19
F9D7: 23            444              DFB   $23
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F9D8: 24          445          DFB   $24
F9D9: 53          446          DFB   $53
F9DA: 1B          447          DFB   $1B
F9DB: 23          448          DFB   $23
F9DC: 24          449          DFB   $24
F9DD: 53          450          DFB   $53
F9DE: 19          451          DFB   $19          ; (A) FORMAT ABOVE
F9DF: A1          452          DFB   $A1
F9E0: 00          453          DFB   $00
F9E1: 1A          454          DFB   $1A
F9E2: 5B          455          DFB   $5B
F9E3: 5B          456          DFB   $5B
F9E4: A5          457          DFB   $A5
F9E5: 69          458          DFB   $69
F9E6: 24          459          DFB   $24          ; (B) FORMAT
F9E7: 24          460          DFB   $24
F9E8: AE          461          DFB   $AE
F9E9: AE          462          DFB   $AE
F9EA: A8          463          DFB   $A8
F9EB: AD          464          DFB   $AD
F9EC: 29          465          DFB   $29
F9ED: 00          466          DFB   $00
F9EE: 7C          467          DFB   $7C          ; (C) FORMAT
F9EF: 00          468          DFB   $00
F9F0: 15          469          DFB   $15
F9F1: 9C          470          DFB   $9C
F9F2. 6D          471          DFB   $6D
F9F3: 9C          472          DFB   $9C
F9F4. A5          473          DFB   $A5
F9F5: 69          474          DFB   $69
F9F6: 29          475          DFB   $29          ; (D) FORMAT
F9F7. 53          476          DFB   $53
F9F8: 84          477          DFB   $84
F9F9. 13          478          DFB   $13
F9FA. 34          479          DFB   $34
F9FB 11           480          DFB   $11
F9FC: A5          481          DFB   $A5
F9FD 69           482          DFB   $69
F9FE: 23          483          DFB   $23          ; (E) FORMAT
F9FF A0           484          DFB   $A0
FA00 D8           485 MNEMR    DFB   $D8
FA01 62           486          DFB   $62
FA02 5A           487          DFB   $5A
FA03. 48          488          DFB   $48
FA04 26           489          DFB   $26
FA05: 62          490          DFB   $62
FA06. 94          491          DFB   $94
FA07: 88          492          DFB   $88
FA08. 54          493          DFB   $54
FA09. 44          494          DFB   $44
FA0A: C8          495          DFB   $C8
FA0B. 54          496          DFB   $54
FA0C 68           497          DFB   $68
FA0D: 44          498          DFB   $44
FA0E E8           499          DFB   $E8
FA0F 94           500          DFB   $94
FA10. 00          501          DFB   $00
FA11 B4           502          DFB   $B4
FA12: 08          503          DFB   $08
FA13: 84          504          DFB   $84
FA14 74           505          DFB   $74
FA15. B4          506          DFB   $B4
FA16 28           507          DFB   $28
FA17 6E           508          DFB   $6E
FA18 74           509          DFB   $74
FA19 F4           510          DFB   $F4
FA1A. CC          511          DFB   $CC
FA1B: 4A          512          DFB   $4A
FA1C. 72          513          DFB   $72
FA1D: F2          514          DFB   $F2
FA1E: A4          515          DFB   $A4          ; (A) FORMAT
FA1F. 8A          516          DFB   $8A
FA20: 00          517          DFB   $00
FA21 AA           518          DFB   $AA
FA22 A2           519          DFB   $A2
FA23 A2           520          DFB   $A2
FA24 74           521          DFB   $74
FA25 74           522          DFB   $74
FA26 74           523          DFB   $74          ; (B) FORMAT
FA27 72           524          DFB   $72
FA28: 44          525          DFB   $44
FA29 68           526          DFB   $68
FA2A: B2          527          DFB   $B2
FA2B 32           528          DFB   $32
FA2C B2           529          DFB   $B2
FA2D 00           530          DFB   $00
FA2E 22           531          DFB   $22          ; (C) FORMAT
FA2F 00           532          DFB   $00
FA30 1A           533          DFB   $1A
FA31 1A           534          DFB   $1A
FA32 26           535          DFB   $26
FA33 26           536          DFB   $26
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FA34: 72              537              OFB   $72
FA35: 72              538              DFB   $72
FA36: 88              539              OFB   $88          ; (D) FORMAT
FA37: C8              540              DFB   $C8
FA38: C4              541              OFB   $C4
FA39: CA              542              OFB   $CA
FA3A: 26              543              DFB   $26
FA3B: 48              544              DFB   $48
FA3C: 44              545              DFB   $44
FA3D: 44              546              DFB   $44
FA3E: A2              547              DFB   $A2          ; (E) FORMAT
FA3F: C8              548              DFB   $C8
FA40: 85 45           549 IRQ          STA   ACC         ; *** IRQ HANDLER
FA42: 68              550              PLA
FA43: 48              551              PHA
FA44: 0A              552              ASL   A
FA45: 0A              553              ASL   A
FA46: 0A              554              ASL   A
FA47: 30 03   FA4C    555              BMI   BREAK       ;TEST FOR 'BRK'
FA49: 6C FE 03        556              JMP   (IRQLOC)    ;USER ROUTINE VECTOR IN RAM
FA4C: 28              557 BREAK        PLP
FA4D: 20 4C FF        558              JSR   SAV1        ;SAVE REG'S ON BREAK
FA50: 68              559              PLA               ; INCLUDING PC
FA51: 85 3A           560              STA   PCL
FA53: 68              561              PLA
FA54: 85 3B           562              STA   PCH
FA56: 6C F0 03        563              JMP   (BRKV)      ;BRKV WRITTEN OVER BY DISK BOOT
FA59: 20 82 F8        564 OLDBRK       JSR   INSDS1      ;PRINT USER PC
FA5C: 20 DA FA        565              JSR   RGDSP1      ;   AND REGS
FA5F: 4C 65 FF        566              JMP   MON         ;GO TO MONITOR (NO PASS GO, NO $200!)
FA62: D8              567 RESET        CLD               ;DO THIS FIRST THIS TIME
FA63: 20 84 FE        568              JSR   SETNORM
FA66: 20 2F FB        569              JSR   INIT
FA69: 20 93 FE        570              JSR   SETVID
FA6C: 20 89 FE        571              JSR   SETKBD
FA6F: AD 58 C0        572 INITAN       LDA   SETANO      ; ANO = TTL HI
FA72: AD 5A C0        573              LDA   SETAN1      ; AN1 = TTL HI
FA75:           0001  574              DO    APPLE2E     ;/RRA0981
FA75: A0 05           575              LDY   #5          ;CODE=INIT/RRA0981
FA77: 20 B4 FB        576              JSR   GOTOCX      ;DO APPLE2E INIT/RRA0981
FA7A: EA              577              NOP               ;/RRA0981
FA7B:                 578              ELSE              ;/RRA0981
 S                    579              LDA   CLRAN2      ; AN2 = TTL LO
 S                    580              LDA   CLRAN3      ; AN3 = TTL LO
FA7B.                 581              FIN               ;/RRA0981
FA7B: AD FF CF        582              LDA   CLRROM      ; TURN OFF EXTNSN ROM
FA7E: 2C 10 C0        583              BIT   KBDSTRB     ; CLEAR KEYBOARD
FA81: D8              584 NEWMON       CLD
FA82: 20 3A FF        585              JSR   BELL        ; CAUSES DELAY IF KEY BOUNCES
FA85: AD F3 03        586              LDA   SOFTEV+1    ;IS RESET HI
FA88: 49 A5           587              EOR   #$A5        ;A FUNNY COMPLEMENT OF THE
FA8A: CD F4 03        588              CMP   PWREDUP     ; PWR UP BYTE ???
FA8D: D0 17   FAA6    589              BNE   PWRUP       ; NO SO PWRUP
FA8F: AD F2 03        590              LDA   SOFTEV      ; YES SEE IF COLD START
FA92: D0 0F   FAA3    591              BNE   NOFIX       ; HAS BEEN DONE YET?
FA94: A9 E0           592              LDA   #$E0        ; DOES SOFT ENTRY VECTOR POINT AT BASIC
FA96: CD F3 03        593              CMP   SOFTEV+1
FA99: D0 08   FAA3    594              BNE   NOFIX       ; YES SO REENTER SYSTEM
FA9B: A0 03           595 FIXSEV       LDY   #3          ; NO SO POINT AT WARM START
FA9D: 8C F2 03        596              STY   SOFTEV      ; FOR NEXT RESET
FAA0: 4C 00 E0        597              JMP   BASIC       ; AND DO THE COLD START
FAA3: 6C F2 03        598 NOFIX        JMP   (SOFTEV)    ; SOFT ENTRY VECTOR
FAA6:                 599 *****************
FAA6: 20 60 F8        600 PWRUP        JSR   APPLEII
FAA9:           FAA9  601 SETPG3       EQU   *           ; SET PAGE 3 VECTORS
FAA9: A2 05           602              LDX   #5
FAAB: BD FC FA        603 SETPLP       LDA   PWRCON-1,X  ; WITH CNTRL B ADRS
FAAE: 9D EF 03        604              STA   BRKV-1,X    ; OF CURRENT BASIC
FAB1: CA              605              DEX
FAB2: D0 F7   FAAB    606              BNE   SETPLP
FAB4: A9 C8           607              LDA   #$C8        ; LOAD HI SLOT +1
FAB6: 86 00           608              STX   LOC0        ; SETPG3 MUST RETURN X=0
FAB8: 85 01           609              STA   LOC1        ; SET PTR H
FABA: A0 07           610 SLOJP        LDY   #7          ; Y IS BYTE PTR
FABC: C6 01           611              DEC   LOC1
FABE: A5 01           612              LDA   LOC1
FAC0: C9 C0           613              CMP   #$C0        ; AT LAST SLOT YET?
FAC2: F0 07   FA9B    614              BEQ   FIXSEV      ; YES AND IT CAN'T BE A DISK
FAC4: 8D F8 07        615              STA   MSLOT
FAC7: B1 00           616 NXTBYT       LDA   (LOC0),Y    ; FETCH A SLOT BYTE
FAC9: D9 01 F8        617              CMP   DISKID-1,Y  ; IS IT A DISK ??
FACC: D0 EC   FABA    618              BNE   SLOOP       ; NO, SO NEXT SLOT DOWN
FACE: 88              619              DEY
FACF: 88              620              DEY               ; YES, SO CHECK NEXT BYTE
FAD0: 10 F5   FAC7    621              BPL   NXTBYT      ; UNTIL 4 BYTES CHECKED
FAD2: 6C 00 00        622              JMP   (LOC0)      ; GO BOOT...
FAD5: EA              623              NOP
FAD6: EA              624              NOP
FAD7:                 625 * REGDSP MUST ORG $FAD7
FAD7: 20 8E FD        626 REGDSP       JSR   CROUT       ;DISPLAY USER REG CONTENTS
FADA: A9 45           627 RGDSP1       LDA   #$45        ;WITH LABELS
FADC: 85 40           628              STA   A3L
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FADE: A9 00          629              LDA   #$00
FAE0: 85 41          630              STA   A3H
FAE2: A2 FB          631              LDX   #$FB
FAE4: A9 A0          632 RDSP1        LDA   #$A0
FAE6: 20 ED FD       633              JSR   COUT
FAE9: BD 1E FA       634              LDA   RTBL-251,X
FAEC: 20 ED FD       635              JSR   COUT
FAEF: A9 BD          636              LDA   #$BD
FAF1: 20 ED FD       637              JSR   COUT
FAF4:                638 * LDA ACC+5,X
FAF4: B5 4A          639              DFB   $B5,$4A
FAF6: 20 DA FD       640              JSR   PRBYTE
FAF9: E8             641              INX
FAFA: 30 E8   FAE4   642              BMI   RDSP1
FAFC: 60             643              RTS
FAFD: 59 FA          644 PWRCON       DW    OLDBRK
FAFF: 00 E0 45       645              DFB   $00,$E0,$45
FB02: 20 FF 00 FF    646 DISKID       DFB   $20,$FF,$00,$FF
FB06: 03 FF 3C       647              DFB   $03,$FF,$3C
FB09: C1 F0 F0 EC    648 TITLE        ASC   'Apple        ]['
FB11.         FB11   649 XLTBL        EQU   *
FB11. C4 C2 C1       650              DFB   $C4,$C2,$C1
FB14: FF C3          651              DFB   $FF,$C3
FB16. FF FF FF       652              DFB   $FF,$FF,$FF
FB19:                653 *  MUST ORG $FB19
FB19: C1 D8 D9       654 RTBL         DFB   $C1,$D8,$D9  ;REGISTER NAMES FOR REGDSP
FB1C: D0 D3          655              DFB   $D0,$D3      ,'AXYPS'
FB1E: AD 70 C0       656 PREAD        LDA   PTRIG        ,TRIGGER PADDLES
FB21: A0 00          657              LDY   #$00         ,INIT COUNT
FB23. EA             658              NOP                ,COMPENSATE FOR 1ST COUNT
FB24: EA             659              NOP
FB25: BD 64 C0       660 PREAD2       LDA   PADDLO,X     ;COUNT Y-REG EVERY 12 USEC
FB28: 10 04   FB2E   661              BPL   RTS2D
FB2A: C8             662              INY
FB2B: D0 F8   FB25   663              BNE   PREAD2       ,EXIT AT 255 MAX
FB2D: 88             664              DEY
FB2E: 60             665 RTS2D        RTS
FB2F:                666              CHN   BUS SRC2
FB2F:                  1 *
FB2F: A9 00            2 INIT         LDA   #$00         ,CLR STATUS FOR DEBUG SOFTWARE
FB31: 85 48            3              STA   STATUS
FB33: AD 56 C0         4              LDA   LORES
FB36: AD 54 C0         5              LDA   LOWSCR       ,INIT VIDEO MODE
FB39: AD 51 C0         6 SETTXT       LDA   TXTSET       ,SET FOR TEXT MODE
FB3C: A9 00            7              LDA   #$00         ,FULL SCREEN WINDOW
FB3E: F0 0B   FB4B     8              BEQ   SETWND
FB40: AD 50 C0         9 SETGR        LDA   TXTCLR       ,SET FOR GRAPHICS MODE
FB43: AD 53 C0        10              LDA   MIXSET       ,LOWER 4 LINES AS TEXT WINDOW
FB46: 20 36 F8        11              JSR   CLRTOP
FB49: A9 14           12              LDA   #$14
FB4B: 85 22           13 SETWND       STA   WNDTOP       ,SET FOR 40 COL WINDOW
FB4D: A9 00           14              LDA   #$00         ;TOP IN A-REG,
FB4F: 85 20           15              STA   WNDLFT       ,  BOTTOM AT LINE $24
FB51:         0001    16              DO    APPLE2E      ;/RRA0981
FB51: A0 08           17              LDY   #8           ,CODE=SETWND /RRA0981
FB53: D0 5F   FBB4    18              BNE   GOTOCX       ;DO 40/80 /RRA0981
FB55:                 19              ELSE               ,/RRA0981
 S                    20              LDA   #$28
 S                    21              STA   WNDWDTH
FB55:                 22              FIN                ,/RRA0981
FB55: A9 18           23              LDA   #$18
FB57: 85 23           24              STA   WNDBTM
FB59: A9 17           25              LDA   #$17         ,VTAB TO ROW 23
FB5B: 85 25           26 TABV         STA   CV           ;VTABS TO ROW IN A-REG
FB5D: 4C 22 FC        27              JMP   VTAB
FB60: 20 58 FC        28 APPLEII      JSR   HOME         ,CLEAR THE SCRN
FB63: A0 08           29              LDY   #8
FB65: B9 08 FB        30 STITLE       LDA   TITLE-1,Y    ;GET A CHAR
FB68: 99 0E 04        31              STA   LINE1+14,Y   ;PUT IT AT TOP CENTER OF SCREEN
FB6B: 88              32              DEY
FB6C: D0 F7   FB65    33              BNE   STITLE
FB6E: 60              34              RTS
FB6F: AD F3 03        35 SETPWRC      LDA   SOFTEV+1     ;ROUTINE TO CALCULATE THE 'FUNNY
FB72: 49 A5           36              EOR   #$A5         ;COMPLEMENT' FOR THE RESET VECTOR
FB74: 8D F4 03        37              STA   PWREDUP
FB77: 60              38              RTS
FB78:         FB78    39 VIDWAIT      EQU   *            ;CHECK FOR A PAUSE (CONTROL-S)
FB78: C9 8D           40              CMP   #$8D         ;ONLY WHEN I HAVE A CR
FB7A: D0 18   FB94    41              BNE   NOWAIT       ;NOT SO, DO REGULAR
FB7C: AC 00 C0        42              LDY   KBD          ;IS KEY PRESSED?
FB7F: 10 13   FB94    43              BPL   NOWAIT       ;NO.
FB81: C0 93           44              CPY   #$93         ;YES -- IS IT CTRL-S?
FB83: D0 0F   FB94    45              BNE   NOWAIT       ;NOPE - IGNORE
FB85: 2C 10 C0        46              BIT   KBDSTRB      ;CLEAR STROBE
FB88: AC 00 C0        47 KBDWAIT      LDY   KBD          ;WAIT TILL NEXT KEY TO RESUME
FB8B: 10 FB   FB88    48              BPL   KBDWAIT      ;WAIT FOR KEYPRESS
FB8D: C0 83           49              CPY   #$83         ;IS IT CONTROL-C?
FB8F: F0 03   FB94    50              BEQ   NOWAIT       ;YES, SO LEAVE IT
FB91: 2C 10 C0        51              BIT   KBDSTRB      ;CLR STROBE
FB94: 4C FD FB        52 NOWAIT       JMP   VIDOUT       ;DO AS BEFORE
FB97: 38              53 ESCOLD       SEC                ;INSURE CARRY SET
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FB9B.4C 2C FC       54              JMP   ESC1
FB9B.AB             55 ESCNOW       TAY                   ;USE CHAR AS INDEX
FB9C.B9 48 FA       56              LDA   XLTBL-$C9,Y     ;TRANSLATE IJKM TO CBAD
FB9F:20 97 FB       57              JSR   ESCOLD          ;DO THE CURSOR MOTION
FBA2:         0001  58              DO    APPLE2E         ;FOR FULL ESCAPES/RRA0981
FBA2:20 21 FD       59              JSR   RDESC           ;GET IJKM, ijkm, ARROWS/RRA0981
FBA5.               60              ELSE                  ;/RRA0981
 S                  61              JSR   RDKEY           ;AND GET NEXT
FBA5:               62              FIN                   ;/RRA0981
FBA5:C9 CE          63 ESCNEW       CMP   #$CE            ;IS THIS AN 'N'?
FBA7:B0 EE    FB97  64              BCS   ESCOLD          ;'N' OR GREATER - DO IT!
FBA9:C9 C9          65              CMP   #$C9            ;LESS THAN 'I'?
FBAB:90 EA    FB97  66              BCC   ESCOLD          ;YES, SO DO OLD WAY
FBAD:C9 CC          67              CMP   #$CC            ;IS IT AN 'L'?
FBAF:F0 E6    FB97  68              BEQ   ESCOLD          ;DO NORMAL
FBB1:D0 E8    FB9B  69              BNE   ESCNOW          ;GO DO IT
FBB3.         0001  70              DO    APPLE2E         ;/RRA0981
FBB3:         C006  71 SETSLOTCXROM EQU   $C006           ;/RRA0981
FBB3:         C007  72 SETINTCXROM  EQU   $C007           ;/RRA0981
FBB3.         C015  73 RDCXROM      EQU   $C015           ;/RRA0981
FBB3:               74 *                                  /RRA0981
FBB3:06             75 VERSION      DFB   $06             ;FOR IDCHECK/RRA0981
FBB4:         FBB4  76 GOTOCX       EQU   *               ;/RRA0981
FBB4:08             77              PHP                   ;SAVE USER IRQ STATE/RRA0981
FBB5:78             78              SEI                   ;INHIBIT DURING BANKSWITCH/RRA0981
FBB6:2C 15 C0       79              BIT   RDCXROM         ;GET CURRENT STATE/RRA0981
FBB9:08             80              PHP                   ;SAVE ROMBANK STATE/RRA0981
FBBA:8D 07 C0       81              STA   SETINTCXROM     ;SET ROMS ON/RRA0981
FBBD:4C 00 C1       82              JMP   $C100           ;=>OFF TO CXSPACE/RRA0981
FBC0:               83 *                                  /RRA0981
FBC0:EA             84              NOP                   ;/RRA0981
FBC1:               85              ELSE                  ;/RRA0981
 S                  86              NOP                   ;"I GOT PLENTY OF NOTHING!"
 S                  87              NOP
 S                  88              NOP
 S                  89              NOP
 S                  90              NOP
 S                  91              NOP
 S                  92              NOP
 S                  93              NOP
 S                  94              NOP
 S                  95              NOP
 S                  96              NOP
 S                  97              NOP
 S                  98              NOP
 S                  99              NOP
FBC1:              100              FIN                   ;/RRA0981
FBC1:              101 *    MUST ORG $FBC1
FBC1:48            102 BASCALC      PHA                   ;CALCBASE ADDR IN BASL,H
FBC2:4A            103              LSR   A               ; FOR GIVEN LINE NO.
FBC3:29 03         104              AND   #$03            ; 0<=LINE NO.<=$17
FBC5:09 04         105              ORA   #$04            ;ARG=000ABCDE, GENERATE
FBC7:85 29         106              STA   BASH            ; BASH=000001CD
FBC9:68            107              PLA                   ; AND
FBCA:29 18         108              AND   #$18            ; BASL=EABAB000
FBCC:90 02    FBD0 109              BCC   BASCLC2
FBCE:69 7F         110              ADC   #$7F
FBD0:85 28         111 BASCLC2      STA   BASL
FBD2:0A            112              ASL   A
FBD3:0A            113              ASL   A
FBD4:05 28         114              ORA   BASL
FBD6:85 28         115              STA   BASL
FBD8:60            116              RTS
FBD9:C9 87         117 BELL1        CMP   #$87            ;BELL CHAR? (CONTROL-G)
FBDB:D0 12    FBEF 118              BNE   RTS2B           ; NO, RETURN.
FBDD:A9 40         119              LDA   #$40            ; YES...
FBDF:20 A8 FC      120              JSR   WAIT            ;DELAY .01 SECONDS
FBE2:A0 C0         121              LDY   #$C0
FBE4:A9 0C         122 BELL2        LDA   #$0C            ;TOGGLE SPEAKER AT 1 KHZ
FBE6:20 A8 FC      123              JSR   WAIT            ; FOR .1 SEC.
FBE9:AD 30 C0      124              LDA   SPKR
FBEC:88            125              DEY
FBED:D0 F5    FBE4 126              BNE   BELL2
FBEF:60            127 RTS2B        RTS
FBF0:A4 24         128 STORADV      LDY   CH              ;CURSOR H INDEX TO Y-REG
FBF2:91 28         129              STA   (BASL),Y        ;STORE CHAR IN LINE
FBF4:E6 24         130 ADVANCE      INC   CH              ;INCREMENT CURSOR H INDEX
FBF6:A5 24         131              LDA   CH              ; (MOVE RIGHT)
FBF8:C5 21         132              CMP   WNDWDTH         ;BEYOND WINDOW WIDTH?
FBFA:B0 66    FC62 133              BCS   CR              ; YES, CR TO NEXT LINE.
FBFC:60            134 RTS3         RTS                   ; NO, RETURN.
FBFD:C9 A0         135 VIDOUT       CMP   #$A0            ;CONTROL CHAR?
FBFF:B0 EF    FBF0 136              BCS   STORADV         ; NO, OUTPUT IT.
FC01:AB            137              TAY                   ;INVERSE VIDEO?
FC02:10 EC    FBF0 138              BPL   STORADV         ; YES, OUTPUT IT.
FC04:C9 8D         139              CMP   #$8D            ;CR?
FC06:F0 5A    FC62 140              BEQ   CR              ; YES.
FC08:C9 8A         141              CMP   #$8A            ;LINE FEED?
FC0A:F0 5A    FC66 142              BEQ   LF              ; IF SO, DO IT.
FC0C:C9 88         143              CMP   #$88            ;BACK SPACE? (CONTROL-H)
FC0E:D0 C9    FBD9 144              BNE   BELL1           ; NO, CHECK FOR BELL.
FC10:C6 24         145 BS           DEC   CH              ;DECREMENT CURSOR H INDEX
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FC12:10 E8    FBFC  146              BPL   RTS3          ;IF POSITIVE, OK; ELSE MOVE UP.
FC14:A5 21          147              LDA   WNDWDTH       ;SET CH TO WINDOW WIDTH - 1.
FC16:85 24          148              STA   CH
FC18:C6 24          149              DEC   CH            ;(RIGHTMOST SCREEN POS)
FC1A:A5 22          150 UP           LDA   WNDTOP        ;CURSOR V INDEX
FC1C:C5 25          151              CMP   CV
FC1E:B0 08    FC28  152              BCS   RTS4          ;IF TOP LINE THEN RETURN
FC20:C6 25          153              DEC   CV            ;DECR CURSOR V INDEX
FC22:A5 25          154 VTAB         LDA   CV            ;GET CURSOR V INDEX
FC24:20 C1 FB       155 VTABZ        JSR   BASCALC       ;GENERATE BASE ADDRESS
FC27:65 20          156              ADC   WNDLFT        ;ADD WINDOW LEFT OFFSET
FC29:85 28          157              STA   BASL          ; TO BASL
FC2B:60             158 RTS4         RTS
FC2C:49 CD          159 ESC1         EOR   #$C0          ;ESC '@'?
FC2E:F0 28    FC58  160              BEQ   HOME          ; IF SO DO HOME AND CLEAR
FC30:69 FD          161              ADC   #$FD          ;ESC-A OR B CHECK
FC32:90 CD    FBF4  162              BCC   ADVANCE       ; A, ADVANCE
FC34:F0 DA    FC10  163              BEQ   BS            ; B, BACKSPACE
FC36:69 FD          164              ADC   #$FD          ;ESC-C OR D CHECK
FC38:90 2C    FC66  165              BCC   LF            ; C, DOWN
FC3A:F0 0E    FC1A  166              BEQ   UP            ; D, GO UP
FC3C:69 FD          167              ADC   #$FD          ;ESC-E OR F CKECK
FC3E:90 5C    FC9C  168              BCC   CLREOL        ; E, CLEAR TO END OF LINE
FC40:DD E9    FC2B  169              BNE   RTS4          ; ELSE NOT F,RETURN
FC42:               0001 17D         DO    APPLE2E       ;/RRA0981
FC42:               FC42 171 CLREOP  EQU   *             ;/RRA0981
FC42:A0 00          172              LDY   #0            ;CODE=CLREOP/RRA0981
FC44:F0 2C    FC72  173              BEQ   XGOTOCX       ;DO 40/80 /RRA0981
FC46:A8 C3 A9 A0    174              ASC   '(C)  1981-82, APPLE'
FC58:               175              ELSE                ;/RRA0981
 S                  176 CLREOP       LDY   CH            ;ESC F IS CLR TO END OF PAGE
 S                  177              LDA   CV
 S                  178 CLEOP1       PHA                 ;SAVE CURRENT LINE NO  ON STACK
 S                  179              JSR   VTABZ         ;CALC BASE ADDRESS
 S                  180              JSR   CLEOLZ        ;CLEAR TO EOL.  (SETS CARRY)
 S                  181              LDY   #$00          ;CLEAR FROM H INDEX=0 FOR REST
 S                  182              PLA                 ;INCREMENT CURRENT LINE NO
 S                  183              ADC   #$00          ;(CARRY IS STILL SET)
 S                  184              CMP   WNDBTM        ;DONE TO BOTTOM OF WINDOW?
 S                  185              BCC   CLEOP1        ; NO, KEEP CLEARING LINES
 S                  186              BCS   VTAB          ; YES, VTAB TO CURRENT LINE
FC58                187              FIN                 ;/RRA0981
FC58.               00D1 188         DO    APPLE2E       ;/RRA0981
FC58:               FC58 189 HOME    EQU   *             ;/RRA0981
FC58.A0 01          190              LDY   #1            ;CODE=HOME/RRA0981
FC5A:D0 16    FC72  191              BNE   XGOTOCX       ;DO 4D/80 /RRAD981
FC5C:D2 C9 C3 CB    192              ASC   'RICK      A' ;OUR HERO.
FC62:               193              ELSE                ;/RRAD981
 S                  194 HOME         LDA   WNDTOP        ;INIT CURSOR V
 S                  195              STA   CV            ;  AND H INDICES
 S                  196              LDY   #$00
 S                  197              STY   CH            ;THEN CLEAR TO END OF PAGE
 S                  198              BEQ   CLEOP1        ;(ALWAYS TAKEN)
FC62:               199              FIN                 ;/RRA0981
FC62:A9 00          200 CR           LDA   #$00          ;CURSOR TO LEFT OF INDEX
FC64:85 24          201              STA   CH            ;(RET CURSOR H=0)
FC66:E6 25          202 LF           INC   CV            ;INCR CURSOR V  (DOWN 1 LINE)
FC68:A5 25          203              LDA   CV
FC6A:C5 23          204              CMP   WNDBTM        ;OFF SCREEN?
FC6C:90 B6    FC24  205              BCC   VTABZ         ;  NO, SET BASE ADDR
FC6E:C6 25          206              DEC   CV            ;DECR CURSOR V.  (BACK TO BOTTOM)
FC70:               0001 207         DO    APPLE2E       ;/RRA0981
FC70:               FC70 208 SCROLL  EQU   *             ;/RRA0981
FC70:A0 02          209              LDY   #2            ;CODE=SCROLL/RRA0981
FC72:4C B4 FB       210 XGOTOCX      JMP   GOTOCX        ;DO 4D/80 /RRA0981
FC75.               211 *
FC75.               212 * IRQ SNIFFER FOR VIDEO CODE.
FC75.               213 *
FC75:               C018 214 RDB0STORE   EQU   $C018     ;/RRA0981
FC75.               C01C 215 RDPAGE2     EQU   $C01C     ;/RRA0981
FC75.48             216              PHA                 ;PRESERVE AC/RRA0981
FC76.AD 1B C0       217              LDA   RDB0STORE     ;FLAG->N /RRAD981
FC79:0A             218              ASL   A             ;FLAG->C /RRA0981
FC7A:68             219              PLA                 ;RESTORE AC/RRA0981
FC7B:2C 1C C0       220              BIT   RDPAGE2       ;FLAG->N /RRA0981
FC7E:08             221              PHP                 ;/RRA0981
FC7F:90 03    FC84  222              BCC   RDCX          ;NOT BANKSWITCHING/RRA0981
FC81:8D 54 C0       223              STA   $C054         ;FORCE MB TXTPAGE/RRA0981
FC84:2C 15 C0       224 RDCX         BIT   RDCXROM       ;FLAG->N /RRA0981
FC87:8D 06 C0       225              STA   SETSLOTCXROM  ;RESTORE BANK/RRA0981
FC8A:58             226              CLI                 ;ENABLE IRQ/RRA0981
FC8B:78             227              SEI                 ;NOW DISABLE/RRA0981
FC8C:10 03    FC91  228              BPL   ISSLOTS       ;=>WAS SLOTS/RRA0981
FC8E:8D 07 C0       229              STA   SETINTCXROM   ;BANK-IN CX/RRA0981
FC91:               FC91 230 ISSLOTS     EQU   *         ;/RRA0981
FC91:28             231              PLP                 ;WHAT VID BANK/PAGE?/RRA0981
FC92.90 05    FC99  232              BCC   ISPAGE1       ;=>NOT BANKED/RRA0981
FC94:10 03    FC99  233              BPL   ISPAGE1       ;IT'S PAGE1/RRA0981
FC96:2C 55 C0       234              BIT   $C055         ;FORCE PAGE2/RRA0981
FC99:               FC99 235 ISPAGE1     EQU   *         ;/RRA0981
FC99.60             236              RTS                 ;CONTINUE VIDEO/RRA0981
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FC9A:EA            237                NOP             ;/RRA0981
FC9B:EA            238                NOP             ;/RRA0981
FC9C:              239                ELSE            ;/RRA0981
 S                 240 SCROLL         LDA   WNDTOP    ;START AT TOP OF SCROLL WINDOW
 S                 241                PHA
 S                 242                JSR   VTABZ     ;GENERATE BASE ADDRESS
 S                 243 SCRL1          LDA   BASL      ;COPY BASL,H
 S                 244                STA   BAS2L     ; TO BAS2L,H
 S                 245                LDA   BASH
 S                 246                STA   BAS2H
 S                 247                LDY   WNDWDTH   ;INIT Y TO RIGHTMOST INDEX
 S                 248                DEY             ; OF SCROLLING WINDOW
 S                 249                PLA
 S                 250                ADC   #$01      ;INCR LINE NUMBER
 S                 251                CMP   WNDBTM    ;DONE?
 S                 252                BCS   SCRL3     ; YES, FINISH
 S                 253                PHA
 S                 254                JSR   VTABZ     ;FORM BASL,H (BASE ADDR)
 S                 255 SCRL2          LDA   (BASL),Y  ;MOVE A CHAR UP ONE LINE
 S                 256                STA   (BAS2L),Y
 S                 257                DEY             ;NEXT CHAR OF LINE
 S                 258                BPL   SCRL2
 S                 259                BMI   SCRL1     ;NEXT LINE
 S                 260 SCRL3          LDY   #$00      ;CLEAR BOTTOM LINE
 S                 261                JSR   CLEOLZ    ;GET BASE ADDR FOR BOTTOM LINE
 S                 262                BCS   VTAB      ;CARRY IS SET
FC9C:              263                FIN             ;/RRA0981
FC9C:        0001  264                DO    APPLE2E   ;/RRA0981
FC9C:        FC9C  265 CLREOL         EQU   *         ;/RRA0981
FC9C:18            266                CLC             ;SAY 'EOL'/RRA0981
FC9D:B0            267                DFB   $B0       ;'BCS' OPCODE /RRA0981
FC9E:        FC9E  268 CLREOLZ        EQU   *         ;/RRA0981
FC9E:38            269                SEC             ;SAY 'EOLZ'/RRA0981
FC9F:84 1F         270                STY   $1F       ;VIDEO'S YSAV1/RRA0981
FCA1:A0 03         271                LDY   #3        ;CODE=EOL/RRA0981
FCA3:90 CD   FC72  272                BCC   XGOTOCX   ;->IT'S EOL/RRA0981
FCA5:C8            273                INY             ;CODE-EOLZ/RRA0981
FCA6:D0 CA   FC72  274                BNE   XGOTOCX   ;->ALWAYS/RRA0981
FCA8:              275                ELSE            ;/RRA0981
 S                 276 CLREOL         LDY   CH        ;CURSOR H INDEX
 S                 277 CLEOLZ         LDA   #$A0      ;STORE BLANKS FROM 'HERE'
 S                 278 CLEOL2         STA   (BASL),Y  ;  TO END OF LINES (WNDWDTH)
 S                 279                INY
 S                 280                CPY   WNDWDTH
 S                 281                BCC   CLEOL2
 S                 282                RTS
FCA8:              283                FIN             ;/RRA0981
FCA8:38            284 WAIT           SEC
FCA9:48            285 WAIT2          PHA
FCAA:E9 01         286 WAIT3          SBC   #$01
FCAC:D0 FC   FCAA  287                BNE   WAIT3     ;1.0204 USEC
FCAE:68            288                PLA             ;(13+2712*A+512*A*A)
FCAF:E9 01         289                SBC   #$01
FCB1:D0 F6   FCA9  290                BNE   WAIT2
FCB3:60            291                RTS
FCB4:E6 42         292 NXTA4          INC   A4L       ;INCR 2-BYTE A4
FCB6:D0 02   FCBA  293                BNE   NXTA1     ; AND A1
FCB8:E6 43         294                INC   A4H
FCBA:A5 3C         295 NXTA1          LDA   A1L       ;INCR 2-BYTE A1.
FCBC:C5 3E         296                CMP   A2L       ; AND COMPARE TO A2
FCBE:A5 3D         297                LDA   A1H       ; (CARRY SET IF >=)
FCC0:E5 3F         298                SBC   A2H
FCC2:E6 3C         299                INC   A1L
FCC4:D0 02   FCC8  300                BNE   RTS4B
FCC6:E6 3D         301                INC   A1H
FCC8:60            302 RTS4B          RTS
FCC9:A0 4B         303 HEADR          LDY   #$4B      ;WRITE A*256 'LONG 1'
FCCB:20 DB FC      304                JSR   ZERDLY    ; HALF CYCLES
FCCE:D0 F9   FCC9  305                BNE   HEADR     ; (650 USEC EACH)
FCD0:69 FE         306                ADC   #$FE
FCD2:B0 F5   FCC9  307                BCS   HEADR     ;THEN A 'SHORT 0'
FCD4:A0 21         308                LDY   #$21      ; (400 USEC)
FCD6:20 DB FC      309 WRBIT          JSR   ZERDLY    ;WRITE TWO HALF CYCLES
FCD9:C8            310                INY             ; OF 250 USEC ('0')
FCDA:C8            311                INY             ; OR 500 USEC ('1')
FCDB:88            312 ZERDLY         DEY
FCDC:D0 FD   FCDB  313                BNE   ZERDLY
FCDE:90 05   FCE5  314                BCC   WRTAPE    ;Y IS COUNT FOR
FCE0:A0 32         315                LDY   #$32      ; TIMING LOOP
FCE2:88            316 ONEDLY         DEY
FCE3:D0 FD   FCE2  317                BNE   ONEDLY
FCE5:AC 20 C0      318 WRTAPE         LDY   TAPEOUT
FCE8:A0 2C         319                LDY   #$2C
FCEA:CA            320                DEX
FCEB:60            321                RTS
FCEC:A2 08         322 RDBYTE         LDX   #$08      ;8 BITS TO READ
FCEE:48            323 RDBYT2         PHA             ;READ TWO TRANSITIONS
FCEF:20 FA FC      324                JSR   RD2BIT    ; (FIND EDGE)
FCF2:68            325                PLA
FCF3:2A            326                ROL   A         ;NEXT BIT
FCF4:A0 3A         327                LDY   #$3A      ;COUNT FOR SAMPLES
FCF6:CA            328                DEX
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FCF7:D0 F5    FCEE  329             BNE   RDBYT2
FCF9:60             330             RTS
FCFA:20 FD FC       331 RD2BIT      JSR   RDBIT
FCFD:88             332 RDBIT       DEY                   ;DECR Y UNTIL
FCFE:AD 60 C0       333             LDA   TAPEIN          ; TAPE TRANSITION
FD01:45 2F          334             EOR   LASTIN
FD03:10 F8    FCFD  335             BPL   RDBIT
FD05:45 2F          336             EOR   LASTIN
FD07:85 2F          337             STA   LASTIN
FD09:C0 80          338             CPY   #$80            ;SET CARRY ON Y-REG
FD0B:60             339             RTS
FD0C:A4 24          340 RDKEY       LDY   CH
FD0E:B1 28          341             LDA   (BASL),Y        ;SET SCREEN TO FLASH
FD10:48             342             PHA
FD11:29 3F          343             AND   #$3F
FD13:09 40          344             ORA   #$40
FD15:91 28          345             STA   (BASL),Y
FD17:68             346             PLA
FD18:6C 38 00       347             JMP   (KSWL)          ;GO TO USER KEY-IN
FD1B:         0001  348             DO    APPLE2E
FD1B:         FD1B  349 KEYIN       EQU   *
FD1B:A0 06          350             LDY   #6              ;RDKEY/RRA0981
FD1D:4C B4 FB       351             JMP   GOTOCX          ;/RRA0981
FD20:EA             352             NOP                   ;/RRA0981
FD21:         FD21  353 RDESC       EQU   *
FD21:20 0C FD       354             JSR   RDKEY           ;GET A KEY
FD24:A0 07          355             LDY   #7              ;CODE=FIXIT
FD26:4C B4 FB       356             JMP   GOTOCX
FD29                357 *
FD29                358 * RETURN FROM GOTOCX HERE
FD29                359 *
FD29:8D 06 C0       360             STA   SETSLOTCXROM    ;RESTORE BANK/RRA0981
FD2C:28             361             PLP                   ;RESTORE IRQ/RRA0981
FD2D:60             362             RTS                   ;RETURN TO CALLER/RRA0981
FD2E                363             ELSE                  ;/RRA0981
 S                  364 KEYIN       INC   RNDL            ;INCR RND NUMBER
 S                  365             BNE   KEYIN2
 S                  366             INC   RNDH
 S                  367 KEYIN2      BIT   KBD             ;KEY DOWN?
 S                  368             BPL   KEYIN           ; LOOP UNTIL WE GET ONE
 S                  369             STA   (BASL),Y        ;REPLACE FLASHING SCREEN
 S                  370             LDA   KBD             ;GET KEYCODE
 S                  371             BIT   KBDSTRB         ;CLR KEY STROBE
FD2E:               372             FIN                   ;/RRA0981
FD2E 60             373             RTS
FD2F:         0001  374             DO    APPLE2E         ;/RRA0981
FD2F:20 21 FD       375 ESC         JSR   RDESC           ;/RRA0981
FD32:                376             ELSE                  ;/RRA0981
 S                  377 ESC         JSR   RDKEY           ;GET KEYCODE
FD32                378             FIN                   ;/RRA0981
FD32:20 A5 FB       379             JSR   ESCNEW          ;HANDLE ESC FUNCTION
FD35:20 0C FD       380 RDCHAR      JSR   RDKEY           ;GO READ KEY
FD38:C9 9B          381             CMP   #$9B            ;'ESC'?
FD3A:F0 F3    FD2F  382             BEQ   ESC             ;  YES, DON'T RETURN
FD3C:60             383             RTS
FD3D:A5 32          384 NOTCR       LDA   INVFLG
FD3F:48             385             PHA
FD40:A9 FF          386             LDA   #$FF
FD42:         0001  387             DO    APPLE2E         ;/RRA0981
FD42:EA             388             NOP                   ;DON'T CHANGE INPUT/RRA0981
FD43:EA             389             NOP                   ; TO NORMAL/RRA0981
FD44:               390             ELSE                  ;/RRA0981
 S                  391             STA   INVFLG          ;CONVERT TYPED CHAR TO 'NORMAL'
FD44                392             FIN                   ;/RRA0981
FD44:BD 0D 02       393             LDA   IN,X
FD47:20 ED FD       394             JSR   COUT            ;ECHO TYPED CHAR
FD4A:68             395             PLA
FD4B:85 32          396             STA   INVFLG
FD4D:BD 00 02       397             LDA   IN,X
FD50:C9 88          398             CMP   #$88            ;CHECK FOR EDIT KEYS
FD52:F0 1D    FD71  399             BEQ   BCKSPC          ;  - BACKSPACE
FD54:C9 98          400             CMP   #$98
FD56:F0 0A    FD62  401             BEQ   CANCEL          ;  - CONTROL-X
FD58:ED F8          402             CPX   #$F8
FD5A:90 03    FD5F  403             BCC   NOTCR1          ;MARGIN?
FD5C:2D 3A FF       404             JSR   BELL            ; YES, SOUND BELL
FD5F:E8             405 NOTCR1      INX                   ;ADVANCE INPUT INDEX
FD60:D0 13    FD75  406             BNE   NXTCHAR
FD62:A9 DC          407 CANCEL      LDA   #$DC            ;BACKSLASH AFTER CANCELLED LINE
FD64:2D ED FD       408             JSR   COUT
FD67:2D 8E FD       409 GETLNZ      JSR   CROUT           ;OUTPUT 'CR'
FD6A:A5 33          410 GETLN       LDA   PROMPT          ;OUTPUT PROMPT CHAR
FD6C:2D ED FD       411             JSR   COUT
FD6F:A2 01          412             LDX   #$01            ;INIT INPUT INDEX
FD71:8A             413 BCKSPC      TXA
FD72:F0 F3    FD67  414             BEQ   GETLNZ          ;WILL BACKSPACE TO 0
FD74:CA             415             DEX
FD75:20 35 FD       416 NXTCHAR     JSR   RDCHAR
FD78:C9 95          417             CMP   #$95            ;USE SCREEN CHAR
FD7A:DD D2    FD7E  418             BNE   CAPTST          ; FOR CONTROL-U
FD7C:B1 28          419             LDA   (BASL),Y
FD7E:C9 E0          420 CAPTST      CMP   #$E0            ;LOWER CASE?
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FD80:90 02    FD84  421              BCC   ADDINP
FD82:         0001  422              DO    APPLE2E      ;/RRA0981
FD82:29 FF          423              AND   #$FF         ;DON'T CONVERT TO UPPER CASE!/RRA0981
FD84:               424              ELSE               ;/RRA0981
 S                  425              AND   #$DF         ;SHIFT TO UPPER CASE
FD84:               426              FIN                ;/RRA0981
FD84:9D 00 02       427 ADDINP       STA   IN,X         ;ADD TO INPUT BUFFER
FD87:C9 8D          428              CMP   #$8D
FD89:D0 82    FD3D  429              BNE   NOTCR
FD8B:20 9C FC       430              JSR   CLREOL       ;CLR TO EOL IF CR
FD8E:A9 8D          431 CROUT        LDA   #$8D
FD90:D0 5B    FDED  432              BNE   COUT         ;(ALWAYS)
FD92:A4 3D          433 PRA1         LDY   A1H          ;PRINT CR,A1 IN HEX
FD94:A6 3C          434              LDX   A1L
FD96:20 BE FD       435 PRYX2        JSR   CROUT
FD99:20 40 F9       436              JSR   PRNTYX
FD9C:A0 00          437              LDY   #$00
FD9E:A9 AD          438              LDA   #$AD         ;PRINT '-'
FDA0:4C ED FD       439              JMP   COUT
FDA3:A5 3C          440 XAMB         LDA   A1L
FDA5:09 07          441              ORA   #$07         ;SET TO FINISH AT
FDA7:85 3E          442              STA   A2L          ; MOD 8=7
FDA9:A5 3D          443              LDA   A1H
FDAB:85 3F          444              STA   A2H
FDAD:A5 3C          445 MOD8CHK      LDA   A1L
FDAF:29 07          446              AND   #$07
FDB1:D0 03    FDB6  447              BNE   DATAOUT
FDB3:20 92 FD       448 XAM          JSR   PRA1
FDB6:A9 A0          449 DATAOUT      LDA   #$A0
FDB8:20 ED FD       450              JSR   COUT         ;OUTPUT BLANK
FDBB:B1 3C          451              LDA   (A1L),Y
FDBD:20 DA FD       452              JSR   PRBYTE       ;OUTPUT BYTE IN HEX
FDC0:20 BA FC       453              JSR   NXTA1
FDC3:90 E8    FDAD  454              BCC   MOD8CHK      ;NOT DONE YET. GO CHECK MOD 8
FDC5:60             455 RTS4C        RTS                ;DONE
FDC6:4A             456 XAMPM        LSR   A            ;DETERMINE IF MONITOR MODE IS
FDC7:90 EA    FDB3  457              BCC   XAM          ; EXAMINE, ADD OR SUBTRACT
FDC9:4A             458              LSR   A
FDCA:4A             459              LSR   A
FDCB:A5 3E          460              LDA   A2L
FDCD:90 02    FDD1  461              BCC   ADD
FDCF:49 FF          462              EOR   #$FF         ;FORM 2'S COMPLEMENT FOR SUBTRACT.
FDD1:65 3C          463 ADD          ADC   A1L
FDD3:48             464              PHA
FDD4:A9 BD          465              LDA   #$BD         ;PRINT '=', THEN RESULT
FDD6:20 ED FD       466              JSR   COUT
FDD9:68             467              PLA
FDDA:48             468 PRBYTE       PHA                ;PRINT BYTE AS 2 HEX DIGITS
FDDB:4A             469              LSR   A            ; (DESTROYS A-REG)
FDDC:4A             470              LSR   A
FDDD:4A             471              LSR   A
FDDE:4A             472              LSR   A
FDDF:20 E5 FD       473              JSR   PRHEXZ
FDE2:68             474              PLA
FDE3:29 0F          475 PRHEX        AND   #$0F         ;PRINT HEX DIGIT IN A-REG
FDE5:09 B0          476 PRHEXZ       ORA   #$B0         ;LSBITS ONLY.
FDE7:C9 BA          477              CMP   #$BA
FDE9:90 02    FDED  478              BCC   COUT
FDEB:69 06          479              ADC   #$06
FDED:6C 36 00       480 COUT         JMP   (CSWL)       ;VECTOR TO USER OUTPUT ROUTINE
FDF0:C9 A0          481 COUT1        CMP   #$A0
FDF2:90 02    FDF6  482              BCC   COUTZ        ;DON'T OUTPUT CTRL'S INVERSE
FDF4:25 32          483              AND   INVFLG       ;MASK WITH INVERSE FLAG
FDF6:84 35          484 COUTZ        STY   YSAV1        ;SAVE Y-REG
FDF8:48             485              PHA                ;SAVE A-REG
FDF9:20 78 F8       486              JSR   VIDWAIT      ;OUTPUT CHR & CHECK FOR CTRL-S
FDFC:68             487              PLA                ;RESTORE A-REG
FDFD:A4 35          488              LDY   YSAV1        ; AND Y-REG
FDFF:60             489              RTS                ; RETURN TO SENDER
FE00:C6 34          490 BL1          DEC   YSAV
FE02:F0 9F    FDA3  491              BEQ   XAMB
FE04:CA             492 BLANK        DEX                ;BLANK TO MON
FE05:D0 16    FE1D  493              BNE   SETMDZ       ;AFTER BLANK
FE07:C9 BA          494              CMP   #$BA         ;DATA STORE MODE?
FE09:D0 BB    FDC6  495              BNE   XAMPM        ; NO; XAM, ADD, OR SUBTRACT
FE0B:85 31          496 STOR         STA   MODE         ;KEEP IN STORE MODE
FE0D:A5 3E          497              LDA   A2L
FE0F:91 40          498              STA   (A3L),Y      ;STORE AS LOW BYTE AT (A3)
FE11:E6 40          499              INC   A3L
FE13:D0 02    FE17  500              BNE   RTS5         ;INCR A3, RETURN.
FE15:E6 41          501              INC   A3H
FE17:60             502 RTS5         RTS
FE18:A4 34          503 SETMODE      LDY   YSAV         ;SAVE CONVERTED ' ', '+',
FE1A:B9 FF 01       504              LDA   IN-1,Y       ; '-', ' ' AS MODE
FE1D:85 31          505 SETMDZ       STA   MODE
FE1F:60             506              RTS
FE20:A2 01          507 LT           LDX   #$01
FE22:B5 3E          508 LT2          LDA   A2L,X        ;COPY A2 (2 BYTES) TO
FE24:95 42          509              STA   A4L,X        ; A4 AND A5
FE26:95 44          510              STA   A5L,X
FE28:CA             511              DEX
FE29:10 F7    FE22  512              BPL   LT2
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FE2B:60          513                RTS
FE2C:B1 3C       514 MOVE           LDA   (A1L),Y      ;MOVE (A1) THRU (A2) TO (A4)
FE2E:91 42       515                STA   (A4L),Y
FE30:20 B4 FC    516                JSR   NXTA4
FE33:90 F7   FE2C 517               BCC   MOVE
FE35:60          518                RTS
FE36:B1 3C       519 VFY            LDA   (A1L),Y      ;VERIFY (A1) THRU (A2)
FE38:D1 42       520                CMP   (A4L),Y      ; WITH (A4)
FE3A:F0 1C   FE58 521               BEQ   VFYOK
FE3C:20 92 FD    522                JSR   PRA1
FE3F:B1 3C       523                LDA   (A1L),Y
FE41:20 DA FD    524                JSR   PRBYTE
FE44:A9 A0       525                LDA   #$A0
FE46:20 ED FD    526                JSR   COUT
FE49:A9 A8       527                LDA   #$A8
FE4B:20 ED FD    528                JSR   COUT
FE4E:B1 42       529                LDA   (A4L),Y
FE50:20 DA FD    530                JSR   PRBYTE
FE53:A9 A9       531                LDA   #$A9
FE55:20 ED FD    532                JSR   COUT
FE58:20 B4 FC    533 VFYOK          JSR   NXTA4
FE5B:90 D9   FE36 534               BCC   VFY
FE5D:60          535                RTS
FE5E:20 75 FE    536 LIST           JSR   A1PC         ;MOVE A1 (2 BYTES) TO
FE61:A9 14       537                LDA   #$14         ; PC IF SPEC'D AND
FE63:48          538 LIST2          PHA                ; DISASSEMBLE 20 INSTRUCTIONS
FE64:20 D0 F8    539                JSR   INSTDSP
FE67:20 53 F9    540                JSR   PCADJ        ;ADJUST PC AFTER EACH INSTRUCTION
FE6A:85 3A       541                STA   PCL
FE6C:84 3B       542                STY   PCH
FE6E:68          543                PLA
FE6F:38          544                SEC
FE70:E9 01       545                SBC   #$01         ;NEXT OF 20 INSTRUCTIONS
FE72:D0 EF   FE63 546               BNE   LIST2
FE74:60          547                RTS
FE75:8A          548 A1PC           TXA                ;IF USER SPECIFIED AN ADDRESS,
FE76:F0 07   FE7F 549               BEQ   A1PCRTS      ; COPY IT FROM A1 TO PC
FE78:B5 3C       550 A1PCLP         LDA   A1L,X        ;YEP, SO COPY IT
FE7A:95 3A       551                STA   PCL,X
FE7C:CA          552                DEX
FE7D:10 F9   FE78 553               BPL   A1PCLP
FE7F:60          554 A1PCRTS        RTS
FE80:A0 3F       555 SETINV         LDY   #$3F         ;SET FOR INVERSE VID
FE82:D0 02   FE86 556               BNE   SETIFLG      ; VIA COUT1
FE84:A0 FF       557 SETNORM        LDY   #$FF         ;SET FOR NORMAL VID
FE86:84 32       558 SETIFLG        STY   INVFLG
FE88:60          559                RTS
FE89:A9 00       560 SETKBD         LDA   #$00         ;DO 'IN#0'
FE8B:85 3E       561 INPORT         STA   A2L          ;DO 'IN#AREG'
FE8D:A2 38       562 INPRT          LDX   #KSWL
FE8F:A0 1B       563                LDY   #KEYIN
FE91:D0 08   FE9B 564               BNE   IOPRT
FE93:A9 00       565 SETVID         LDA   #$00         ;DO 'PR#0'
FE95:85 3E       566 OUTPORT        STA   A2L          ;DO 'PR#AREG'
FE97:A2 36       567 OUTPRT         LDX   #CSWL
FE99:A0 F0       568                LDY   #COUT1
FE9B:A5 3E       569 IOPRT          LDA   A2L          ;SET INPUT/OUTPUT VECTORS
FE9D:29 0F       570                AND   #$0F
FE9F:F0 06   FEA7 571               BEQ   IOPRT1
FEA1:09 C0       572                ORA   #<IOADR
FEA3:A0 00       573                LDY   #$00
FEA5:F0 02   FEA9 574               BEQ   IOPRT2
FEA7:A9 FD       575 IOPRT1         LDA   #>COUT1
FEA9:        FEA9 576 IOPRT2         EQU   *
FEA9:94 00       577                STY   LOC0,X
FEAB:95 01       578                STA   LOC1,X
FEAD:60          579                RTS
FEAE:EA          580                NOP
FEAF:00          581 CKSUMFIX       DFB   0            ;/RRA0981
FEB0:            582 *    ,-->CORRECT CKSUM AT CREATE TIME.
FEB0:4C 00 E0    583 XBASIC         JMP   BASIC        ;TO BASIC, COLD START
FEB3:4C 03 E0    584 BASCONT        JMP   BASIC2       ;TO BASIC, WARM START
FEB6:20 75 FE    585 GO             JSR   A1PC         ;ADDR TO PC IF SPECIFIED
FEB9:20 3F FF    586                JSR   RESTORE      ;RESTORE FAKE REGISTERS
FEBC:6C 3A 00    587                JMP   (PCL)        ;AND GO!
FEBF:4C D7 FA    588 REGZ           JMP   REGDSP       ;GO DISPLAY REGISTERS
FEC2:60          589 TRACE          RTS                ;TRACE IS GONE
FEC3:EA          590                NOP
FEC4:60          591 STEPZ          RTS                ;STEP IS GONE
FEC5:C2 F2 F9 E1 592                ASC   'Bryan'
FECA:4C F8 03    593 USR            JMP   USRADR       ;JUMP TO CONTROL-Y VECTOR IN RAM
FECD:A9 40       594 WRITE          LDA   #$40         ;TAPE WRITE ROUTINE
FECF:20 C9 FC    595                JSR   HEADR        ;WRITE 10-SEC HEADER
FED2:A0 27       596                LDY   #$27
FED4:A2 00       597 WR1            LDX   #$00
FED6:41 3C       598                EOR   (A1L,X)
FED8:48          599                PHA
FED9:A1 3C       600                LDA   (A1L,X)
FEDB:20 ED FE    601                JSR   WRBYTE
FEDE:20 BA FC    602                JSR   NXTA1
FEE1:A0 1D       603                LDY   #$1D
FEE3:68          604                PLA
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FEE4:90 EE   FED4  605           BCC   WR1
FEE6:A0 22         606           LDY   #$22
FEE8:20 ED FE      607           JSR   WRBYTE
FEEB:F0 4D   FF3A  608           BEQ   BELL
FEED:A2 10         609 WRBYTE    LDX   #$10
FEEF:0A            610 WRBYT2    ASL   A
FEF0:20 D6 FC      611           JSR   WRBIT
FEF3:D0 FA   FEEF  612           BNE   WRBYT2
FEF5:60            613           RTS
FEF6:20 00 FE      614 CRMON     JSR   BL1         ;HANDLE CR AS BLANK
FEF9:68            615           PLA               ; THEN POP STACK
FEFA:68            616           PLA               ; AND RETURN TO MON
FEFB:D0 6C   FF69  617           BNE   MONZ        ;(ALWAYS)
FEFD:20 FA FC      618 READ      JSR   RD2BIT      ;TAPE READ - FIND TAPEIN EDGE
FF00:A9 16         619           LDA   #$16        ;DELAY 3.5 SECONDS
FF02:20 C9 FC      620           JSR   HEADR
FF05:85 2E         621           STA   CHKSUM      ;INITIAL CHECKSUM = $FF
FF07:20 FA FC      622           JSR   RD2BIT      ;FIND AN EDGE
FF0A:A0 24         623 RD2       LDY   #$24        ;LOOK FOR SYNC BIT
FF0C:20 FD FC      624           JSR   RDBIT       ; (SHORT 0)
FF0F:B0 F9   FF0A  625           BCS   RD2         ;LOOP 'TIL FOUND
FF11:20 FD FC      626           JSR   RDBIT       ;SKIP 2ND HALF CYCLE
FF14:A0 3B         627           LDY   #$3B        ;INDEX FOR 0/1 TEST
FF16:20 EC FC      628 RD3       JSR   RDBYTE      ;READ A BYTE
FF19:81 3C         629           STA   (A1L,X)     ;PUT IT AT (A1)
FF1B:45 2E         630           EOR   CHKSUM      ;UPDATE RUNNING CHECKSUM
FF1D:85 2E         631           STA   CHKSUM
FF1F:20 BA FC      632           JSR   NXTA1       ;INCR A1, COMPARE TO A2
FF22:A0 35         633           LDY   #$35        ;COMPENSATE 0/1 INDEX
FF24:90 F0   FF16  634           BCC   RD3         ;REPEAT 'TIL DONE
FF26:20 EC FC      635           JSR   RDBYTE      ;READ CHECKSUM BYTE
FF29:C5 2E         636           CMP   CHKSUM      ;DOES THE RECORDED CHKSM MATCH OURS?
FF2B:F0 0D   FF3A  637           BEQ   BELL        ; YEP, READ OK  BEEP AND RETURN
FF2D:A9 C5         638 PRERR     LDA   #$C5        ;PRINT 'ERR', THEN FALL INTO
FF2F:20 ED FD      639           JSR   COUT        ; FWEEPER
FF32:A9 D2         640           LDA   #$D2
FF34:20 ED FD      641           JSR   COUT
FF37:20 ED FD      642           JSR   COUT
FF3A:A9 87         643 BELL      LDA   #$87        ;MAKE A JOYFUL NOISE, THEN RETURN.
FF3C:4C ED FD      644           JMP   COUT
FF3F:A5 48         645 RESTORE   LDA   STATUS      ;RESTORE 6502 REGISTER CONTENTS
FF41:48            646           PHA               ; USED BY DEBUG SOFTWARE
FF42:A5 45         647           LDA   A5H
FF44:A6 46         648 RESTR1    LDX   XREG
FF46:A4 47         649           LDY   YREG
FF48:28            650           PLP
FF49:60            651           RTS
FF4A:85 45         652 SAVE      STA   A5H         ;SAVE 6502 REGISTER CONTENTS
FF4C:86 46         653 SAV1      STX   XREG        ; FOR DEBUG SOFTWARE
FF4E:84 47         654           STY   YREG
FF50:08            655           PHP
FF51:68            656           PLA
FF52:85 48         657           STA   STATUS
FF54:BA            658           TSX
FF55:86 49         659           STX   SPNT
FF57:D8            660           CLD
FF58:60            661           RTS
FF59:20 84 FE      662 OLDRST    JSR   SETNORM      ;SET SCREEN MODE
FF5C:20 2F FB      663           JSR   INIT        ; AND INIT KBD/SCREEN
FF5F:20 93 FE      664           JSR   SETVID      ; AS I/O DEVS
FF62:20 89 FE      665           JSR   SETKBD
FF65:D8            666 MON       CLD               ;MUST SET HEX MODE!
FF66:20 3A FF      667           JSR   BELL        ;FWEEPER
FF69:A9 AA         668 MONZ      LDA   #$AA        ;'*' PROMPT FOR MONITOR
FF6B:85 33         669           STA   PROMPT
FF6D:20 67 FD      670           JSR   GETLNZ      ;READ A LINE OF INPUT
FF70:20 C7 FF      671           JSR   ZMODE       ;CLEAR MONITOR MODE, SCAN IDX
FF73:20 A7 FF      672 NXTITM    JSR   GETNUM      ;GET ITEM, NON-HEX
FF76:84 34         673           STY   YSAV        ; CHAR IN A-REG.
FF78:A0 17         674           LDY   #$17        ; X-REG=0 IF NO HEX INPUT
FF7A:88            675 CHRSRCH   DEY
FF7B:30 E8   FF65  676           BMI   MON         ;COMMAND NOT FOUND, BEEP & TRY AGAIN.
FF7D:D9 CC FF      677           CMP   CHRTBL,Y    ;FIND COMMAND CHAR IN TABLE
FF80:D0 F8   FF7A  678           BNE   CHRSRCH     ;NOT THIS TIME
FF82:20 BE FF      679           JSR   TOSUB       ;GOT IT' CALL CORRESPONDING SUBROUTINE
FF85:A4 34         680           LDY   YSAV        ;PROCESS NEXT ENTRY ON HIS LINE
FF87:4C 73 FF      681           JMP   NXTITM
FF8A:A2 03         682 DIG       LDX   #$03
FF8C:0A            683           ASL   A
FF8D:0A            684           ASL   A           ;GOT HEX DIGIT,
FF8E:0A            685           ASL   A           ; SHIFT INTO A2
FF8F:0A            686           ASL   A
FF90:0A            687 NXTBIT    ASL   A
FF91:26 3E         688           ROL   A2L
FF93:26 3F         689           ROL   A2H
FF95:CA            690           DEX               ;LEAVE X=$FF IF DIG
FF96:10 F8   FF90  691           BPL   NXTBIT
FF98:A5 31         692 NXTBAS    LDA   MODE
FF9A:D0 06   FFA2  693           BNE   NXTBS2      ;IF MODE IS ZERO,
FF9C:B5 3F         694           LDA   A2H,X       ; THEN COPY A2 TO A1 AND A3
FF9E:95 3D         695           STA   A1H,X
FFA0:95 41         696           STA   A3H,X
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FFA2: E8              697 NXTBS2    INX
FFA3: F0 F3    FF98   698           BEQ   NXTBAS
FFA5: D0 06    FFAD   699           BNE   NXTCHR
FFA7: A2 00           700 GETNUM    LDX   #$D0          ;CLEAR A2
FFA9: 86 3E           701           STX   A2L
FFAB: 86 3F           702           STX   A2H
FFAD: B9 00 02        703 NXTCHR    LDA   IN,Y          ;GET CHAR
FFB0: C8              704           INY
FFB1: 49 B0           705           EOR   #$B0
FFB3: C9 0A           706           CMP   #$0A
FFB5: 90 D3    FF8A   707           BCC   DIG           ;BR IF HEX DIGIT
FFB7: 69 88           708           ADC   #$88
FFB9: C9 FA           709           CMP   #$FA
FFBB: B0 CD    FF8A   710           BCS   DIG
FFBD: 60              711           RTS
FFBE: A9 FE           712 TOSUB     LDA   #CGO          ;DISPATCH TO SUBROUTINE, BY
FFC0: 48              713           PHA                 ; PUSHING THE HI-ORDER SUBR ADDR,
FFC1: B9 E3 FF        714           LDA   SUBTBL,Y      ; THEN THE LO-ORDER SUBR ADDR
FFC4: 48              715           PHA                 ; ONTO THE STACK,
FFC5: A5 31           716           LDA   MODE          ; (CLEARING THE MODE, SAVE THE OLD
FFC7: A0 00           717 ZMODE     LDY   #$00          ; MODE IN A-REG),
FFC9: 84 31           718           STY   MODE
FFCB: 60              719           RTS                 ; AND 'RTS' TO THE SUBROUTINE'
FFCC: BC              720 CHRTBL    DFB   $BC           ;^C   (BASIC WARM START)
FFCD: B2              721           DFB   $B2           ;^Y   (USER VECTOR)
FFCE: BE              722           DFB   $BE           ;^E   (OPEN AND DISPLAY REGISTERS)
FFCF: B2              723           DFB   $B2           ;T    (ONCE WAS TRACE, NEVER USED )
FFD0: EF              724           DFB   $EF           ;V    (MEMORY VERIFY)
FFD1: C4              725           DFB   $C4           ;^K   (IN#SLOT)
FFD2: B2              726           DFB   $B2           ;S    (ONCE WAS STEP, NOW NEVER USED )
FFD3: A9              727           DFB   $A9           ;^P   (PR#SLOT)
FFD4: BB              728           DFB   $BB           ;^B   (BASIC COLD START)
FFD5: A6              729           DFB   $A6           ;'-'  (SUBTRACTION)
FFD6: A4              730           DFB   $A4           ;'+'  (ADDITION)
FFD7: 06              731           DFB   $06           ;M    (MEMORY MOVE)
FFD8: 95              732           DFB   $95           ;'<'  (DELIMITER FOR MOVE, VFY)
FFD9: 07              733           DFB   $07           ;N    (SET NORMAL VIDEO)
FFDA: 02              734           DFB   $02           ;I    (SET INVERSE VIDEO)
FFDB: 05              735           DFB   $05           ;L    (DISASSEMBLE 20 INSTRS)
FFDC: F0              736           DFB   $F0           ;W    (WRITE TO TAPE)
FFDD: 00              737           DFB   $00           ;G    (EXECUTE PROGRAM)
FFDE: EB              738           DFB   $EB           ;R    (READ FROM TAPE)
FFDF: 93              739           DFB   $93           ;':'  (MEMORY FILL)
FFE0: A7              740           DFB   $A7           ;'.'  (ADDRESS DELIMITER)
FFE1: C6              741           DFB   $C6           ;'CR' (END OF INPUT)
FFE2: 99              742           DFB   $99           ;BLANK
FFE3: B2              743 SUBTBL    DFB   $B2           ;TABLE OF LO-ORDER MONITOR ROUTINE
FFE4: C9              744           DFB   $C9           ; DISPATCH ADDRESSES
FFE5: BE              745           DFB   $BE
FFE6: C1              746           DFB   $C1
FFE7: 35              747           DFB   $35
FFE8: BC              748           DFB   $BC
FFE9: C4              749           DFB   $C4
FFEA: 96              750           DFB   $96
FFEB: AF              751           DFB   $AF
FFEC: 17              752           DFB   $17
FFED: 17              753           DFB   $17
FFEE: 2B              754           DFB   $2B
FFEF: 1F              755           DFB   $1F
FFF0: 83              756           DFB   $83
FFF1: 7F              757           DFB   $7F
FFF2: 5D              758           DFB   $5D
FFF3: CC              759           DFB   $CC
FFF4: B5              760           DFB   $B5
FFF5: FC              761           DFB   $FC
FFF6: 17              762           DFB   $17
FFF7: 17              763           DFB   $17
FFF8: F5              764           DFB   $F5
FFF9: D3              765           DFB   $D3
FFFA: FB 03           766           DW    NMI           ;NON-MASKABLE INTERRUPT VECTOR
FFFC: 62 FA           767           DW    RESET         ;RESET VECTOR
FFFE: 4D FA           768           DW    IRQ           ;INTERRUPT REQUEST VECTOR
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Monitor Symbol Table, Sorted by Symbol

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   3D A1H          3C A1L          FE75 A1PC       FE78 A1PCLP
 FE7F A1PCRTS      3F A2H            3E A2L          41 A3H
   40 A3L          43 A4H            42 A4L          45 A5H
   44 A5L          45 ACC          FDD1 ADD        FD84 ADD1NP
 FBF4 ADVANCE    ?03F5 AMPERV        01 APPLE2E    FB60 APPLEII
?  2B BAS2H     ?  2A BAS2L       FBC1 BASCALC    FBD0 BASCLC2
?FE83 BASCDNT      29 BASH         E000 BASIC      E003 BASIC2
   28 BASL       FD71 BCKSPC     FBD9 BELL1      FBE4 BELL2
 FF3A BELL       FE00 BL1        ?FE04 BLANK     FA4C BREAK
 03F0 BRKV       FC10 BS         FD62 CANCEL     FD7E CAPTST
 F984 CHAR1      F9BA CHAR2        2E CHKSUM     FF7A CHRSRCH
   24 CH         FFCC CHRTBL     ?FEAF CKSUMFIX  ?C059 CLRANO
?C05B CLRAN1    ?C05D CLRAN2    ?C05F CLRAN3    FC9C CLREDL
?FC9E CLREOLZ   ?FC42 CLREDP      CFFF CLRRDM   F838 CLRSC2
 F83C CLRSC3    ?F832 CLRSCR    F836 CLRTDP       30 CDLOR
 FDED CDUT       FDF0 COUT1      FDF6 CDUTZ    FD8E CROUT
 FC62 CR       ?FEF6 CRMON     ?  37 CSWH        36 CSWL
   25 CV         FDB6 DA1AOUT    FF8A DIG      FB02 DISKID
 F8A5 ERR        FD2F ESC        FC2C ESC1     FBA5 ESCNEW
 FB9B ESCNDW     FB97 ESCDLD     FA9B FIXSCV   F962 FMT1
 F9A6 FMT2         2E FDRMAT     F847 GBASCALC   27 GBASH
   26 GBASL      F856 GBCALC     F8A9 GETFMT   ?FD6A GETLN
 FD67 GETLNZ     FFA7 GETNUM     FBB4 GOTOCX   FEB6 GO
   2C H2         FCC9 HEADR      ?C057 HIRES   ?C055 HISCR
?F819 HLINE      F81C HLINE1     FC58 HOME     F89B IEVEN
?FA6F INITAN     FB2F INIT       ?FE8B INPDRT  ?FE8D INPRT
 F882 INSDS1     ?F88C INSDS2    F8D0 INSTDSP    32 INVFLG
 0200 IN         C000 IDADR      FEA7 IDPRT1   FEA9 IDPRT2
 FE9B IDPRT      03FE IRQLOC     FA40 IRQ      FC99 ISPAGE1
 FC91 ISSLDTS    C000 KBD        C010 KBDSTRB  FB88 KBDWAIT
 FD1B KEYIN      ?  39 KSWH        38 KSWL       2F LASTIN
   2F LENGTH     FC66 LF         0400 LINE1    FE63 LIST2
?FE5E LIST         2C LMNEM       00 LOC0       01 LOC1
 C056 LORES      C054 LDWSCR     ?FE20 LT      FE22 LT2
   2E MASK       ?C052 MIXCLR    C053 MIXSET   F9C0 MNEML
 FA00 MNEMR      F8BE MNNDX1     F8C2 MNNDX2   F8C9 MNNDX3
 FDAD MDDBCHK      31 MDDE       FF65 MDN      FF69 MONZ
 FE2C MOVE       07F8 MSLDT      ?FA81 NEWMON  03FB NMI
 FAA3 NOFIX      FD5F NDTCR1     FD3D NDTCR    FB94 NDWAIT
 FCBA NXTA1      FCB4 NXTA4      FF98 NXTBAS   FF90 NXTBIT
 FFA2 NXTBS2     FAC7 NXTBYT     FD75 NXTCHAR  FFAD NXTCHR
?F85F NXTCDL     FF73 NXTITM     FA59 DLDBRK   ?FF59 DLDRST
 FCE2 ONEDLY     ?FE95 OUTPDRT   ?FE97 DUTPRT  C064 PADDLO
?F954 PCADJ2     F956 PCADJ3     F953 PCADJ    F95C PCADJ4
   3B PCH          3A PCL     ?  95 PICK      F80E PLDT1
 F800 PLOT       FD92 PRA1       F910 PRADR1   F914 PRADR2
 F926 PRADR3     F92A PRADR4     F930 PRADR5   F94A PRBL2
?F94C PRBL3      F948 PRBLNK     FDDA PRBYTE   F825 PREAD2
?FB1E PREAD      ?FF2D PRERR     FDE5 PRHEX2   ?FDE3 PRHEX
 F8F5 PRMN1      F8F9 PRMN2    ?F941 PRNTAX    F8DB PRNTBL
 F8D4 PRNTOP     ?F944 PRNTX     F940 PRNTYX     33 PRDMPT
 FD96 PRYX2      C070 PTRIG      FAFD PWRCDN   03F4 PWREDUP
 FAA6 PWRUP      FCFA RD2BIT     FF0A RD2      FF16 RD3
 C018 RDBOSTDRE  FCFD RDBIT      FCEE RDBYT2   FCEC RDBYTE
 FD35 RDCHAR     C015 RDCXRDM    FCB4 RDCX     FD21 RDESC
 FD0C RDKEY      C01C RDPAGE2    FAE4 RDSP1    ?FEFD READ
 FAD7 REQDSP     ?FEBF REQZ    ?F938 RELADR    FA62 RESET
 FF3F RESTDRE    ?FF44 RESTR1    FADA RGDSP1     2D RMNEM
?  4F RNDH      ?  4E RNDL      FB19 RTBL     F80C RTMASK
 F87F RTMSKZ     F831 RTS1       F961 RTS2     FBEF RTS2B
 FB2E RTS2D      FBFC RTS3       FCC8 RTS4B    ?FDC5 RTS4C
 FC2B RTS4       FE17 RTS5       FF4C SAV1     ?FF4A SAVE
?F871 SCRN       F879 SCRN2    ?FC70 SCROLL    C058 SETANO
 C05A SETAN1     ?C05C SETAN2  ?C05E SETAN3    ?F864 SETCOL
?FB40 SETGR      FE86 SETIFLG    C007 SETINTCXROM ?FE80 SETINV
 FE89 SETKBD     FE1D SETMDZ   ?FE18 SETMODE     FE84 SETNDRM
?FAA9 SETPG3     FAAB SETPLP   ?FB6F SETPWRC     C006 SETSLOTCXROM
?FB39 SETTXT     FE93 SETVID     FB4B SETWND   ?  2F SIGN
 FA8A SLDOP      03F2 SOFTEV     C030 SPKR       49 SPNT
   48 STATUS     ?FEC4 STEPZ     FB65 STITLE   ?FE0B STOR
 FBF0 STORADV      FFE3 SUBTBL   ?FB5B TABV      C060 TAPEIN
 C020 TAPEOUT    FB09 TITLE      FFBE TOSUB    ?FEC2 TRACE
 C050 TXTCLR     C051 TXTSET     FC1A UP       ?FECA USR
 03F8 USRADR       2D V2       ?FBB3 VERSION     FE58 VFYOK
 FE36 VFY        FBFD VIDOUT     FB78 VIDWAIT    F828 VLINE
 F826 VLINEZ     FC22 VTAB       FC24 VTABZ      FCA8 WAIT
 FCA9 WAIT2      FCAA WAIT3        23 WNDBTM       20 WNDLFT
```

```
   22 WNDTOP          21 WNDWDTH       FED4 WR1          FCD6 WRBIT
 FEEF WRBYT2        FEED WRBYTE      ?FECD WRITE         FCE5 WRTAPE
 FDB3 XAM           FDA3 XAMB         FDC6 XAMPM        ?FE8D XBASIC
 FC72 XGOTOCX       FB11 XLTBL          46 XREG            47 YREG
   34 YSAV            35 YSAV1        FCDB ZERDLY         FFC7 ZMODE
** SUCCESSFUL ASSEMBLY := NO ERRORS
** ASSEMBLER CREATED ON 05-JAN-82 000004
** TOTAL LINES ASSEMBLED  1435
** FREE SPACE PAGE COUNT   67
    2  BJS.SRC2
```

Monitor Symbol Table, Sorted by Address

```
   00 LOC0          01 APPLE2E       01 LOC1          20 WNDLFT
   21 WNDWDTH       22 WNDTOP        23 WNDBTM        24 CH
   25 CV            26 GBASL         27 GBASH         28 BASL
   29 BASH        ? 2A BAS2L       ? 2B BAS2H         2C H2
   2C LMNEM         2D V2            2D RMNEM         2E MASK
   2E CHKSUM        2E FORMAT        2F LASTIN        2F LENGTH
 ? 2F SIGN          3D COLOR         31 MODE          32 INVFLG
   33 PROMPT        34 YSAV          35 YSAV1         36 CSWL
 ? 37 CSWH          38 KSWL        ? 39 KSWH          3A PCL
   3B PCH           3C A1L           3D A1H           3E A2L
   3F A2H           40 A3L           41 A3H           42 A4L
   43 A4H           44 A5L           45 A5H           45 ACC
   46 XREG          47 YREG          48 STATUS        49 SPNT
 ? 4E RNDL        ? 4F RNDH        ? 95 PICK          020D IN
  03F0 BRKV         D3F2 SOFTEV      03F4 PWREDUP     ?03F5 AMPERV
  D3F8 USRADR       03FB NMI         D3FE IRQLOC      040D LINE1
  07F8 MSLOT        CDDD IOADR       C000 KBD         CDD6 SETSLOTCXROM
  CDD7 SETINTCXROM  C010 KBDSTRB     C015 RDCXROM     C018 ROMSTORE
  C01C RDPAGE2      C020 TAPEOUT     C030 SPKR        C050 TXTCLR
  CD51 TXTSET     ?C052 MIXCLR       C053 MIXSET      C054 LOWSCR
?CD55 HISCR         C056 LORES     ?C057 HIRES        CD58 SETAND
?CD59 CLRAN0        C05A SETAN1    ?C05B CLRAN1     ?C05C SETAN2
?C05D CLRAN2      ?C05E SETAN3     ?C05F CLRAN3       CD60 TAPEIN
  C064 PADDL0       C070 PTRIG       CFFF CLRROM      ED0D BASIC
  E0D3 BASIC2       F800 PLOT        F80C RTMASK      F80E PLOT1
?F819 HLINE         F81C HLINE1      F826 VLINEZ      F828 VLINE
  F831 RTS1       ?F832 CLRSCR       F836 CLRTOP      F838 CLRSC2
  F83C CLRSC3       F847 GBASCALC    F856 GBCALC    ?F85F NXTCOL
?F864 SETCOL      ?F871 SCRN         F879 SCRN2       F87F RTMSKZ
  F882 INSDS1     ?F88C INSDS2       F89B IEVEN       F8A5 ERR
  F8A9 GETFMT       F8BE MNNDX1      F8C2 MNNDX2      F8C9 MNNDX3
  F8D0 INSTDSP      F8D4 PRNTOP      F8DB PRNTBL      F8F5 PRMN1
  F8F9 PRMN2        F910 PRADR1      F914 PRADR2      F926 PRADR3
  F92A PRADR4       F93D PRADR5    ?F938 RELADR       F94D PRNTYX
?F941 PRNTAX      ?F944 PRNTX        F948 PRBLNK      F94A PRBL2
?F94C PRBL3         F953 PCADJ     ?F954 PCADJ2       F956 PCADJ3
  F95C PCADJ4       F961 RTS2        F962 FMT1        F9A6 FMT2
  F9B4 CHAR1        F9BA CHAR2       F9CD MNEML       FA00 MNEMR
  FA40 IRQ          FA4C BREAK       FA59 OLDBRK      FA62 RESET
?FA6F INITAN      ?FA81 NEWMON       FA9B FIXSEV      FAA3 NOFIX
  FAA6 PWRUP      ?FAA9 SETPG3       FAAB SETPLP      FABA SLOOP
  FAC7 NXTBYT       FAD7 REGDSP      FADA RGDSP1      FAE4 RGSP1
  FAFD PWRCON       FB02 OISKID      FBD9 TITLE       FB11 XLTBL
  FB19 RTBL       ?FB1E PREAD        FB25 PREAD2      FB2E RTS2D
  FB2F INIT       ?FB39 SETTXT     ?FB40 SETGR        FB4B SETWND
?FB5B TABV          FB60 APPLEII     FB65 STITLE    ?FB6F SETPWRC
  FB78 VIDWAIT      FB88 KBDWAIT     FB94 NOWAIT      FB97 ESCOLD
  FB9B ESCNOW       FBA5 ESCNEW    ?FBB3 VERSION      FBB4 GOTOCX
  FBC1 BASCALC      FBD0 BASCLC2     FBD9 BELL1       FBE4 BELL2
  FBEF RTS2B        FBFD STORADV     FBF4 ADVANCE     FBFC RTS3
  FBFD VIDOUT       FC10 BS          FC1A UP          FC22 VTAB
  FC24 VTABZ        FC2B RTS4        FC2C ESC1      ?FC42 CLREOP
  FC58 HOME         FC62 CR          FC66 LF        ?FC7D SCROLL
  FC72 XGOTOCX      FC84 ROCX        FC91 ISSLOTS     FC99 ISPAGE1
  FC9C CLREOL     ?FC9E CLREOLZ      FCA8 WAIT        FCA9 WAIT2
  FCAA WAIT3        FCB4 NXTA4       FCBA NXTA1       FCC8 RTS4B
  FCC9 HEADR        FCD6 WRBIT       FCDB ZEROLY      FCE2 ONEDLY
  FCE5 WRTAPE       FCEC RDBYTE      FCEE RD8YT2      FCFA RD2BIT
  FCFD RDBIT        FD0C RDKEY       FD1B KEYIN       FD21 RDESC
  FD2F ESC          FD35 RDCHAR      FD3D NOTCR       FD5F NOTCR1
  FD62 CANCEL       FD67 GETLNZ      FD71 BCKSPC      FD8E CROUT
  FD75 NXTCHAR      FD7E CAPTST      FDB4 ADDINP      FDAD MODBCHK
  FD92 PRA1         FD96 PRYX2       FDA3 XAMB        FDC6 XAMPM
  FDB3 XAM          FDB6 DATAOUT   ?FDC5 RTS4C      ?FDE5 PRHEX
  FDD1 AOD          FDDA PRBYTE    ?FDE3 PRHEX        FDE5 PRHEXZ
  FDED COUT         FDF0 COUT1       FDF6 COUTZ       FE00 BL1
?FE04 BLANK       ?FE0B STOR         FE17 RTS5      ?FE18 SETMODE
  FE1D SETMDZ     ?FE20 LT           FE22 LT2         FE2C MOVE
  FE36 VFY          FE58 VFYOK     ?FE5E LIST         FE63 LIST2
  FE75 A1PC         FE7B A1PCLP      FE7F A1PCRTS   ?FE80 SETINV
  FE84 SETNORM      FE86 SETIFLG     FE89 SETKBD    ?FE8B INPORT
?FE8D INPRT         FE93 SETVID    ?FE95 OUTPORT    ?FE97 OUTPRT
  FE9B IOPRT        FEA7 IOPRT1      FEA9 IOPRT2    ?FEAF CKSUMFIX
?FEB0 XBASIC      ?FEB3 BASCONT      FEB6 GO        ?FEBF REGZ
?FEC2 TRACE       ?FEC4 STEPZ      ?FECA USR        ?FECD WRITE
  FED4 WR1          FEED WRBYTE      FEEF WRBYT2    ?FEF6 CRMON
```

```
?FEFD READ          FF0A RD2           FF16 RD3          ?FF2D PRERR
 FF3A BELL          FF3F RESTORE      ?FF44 RESTR1       ?FF4A SAVE
 FF4C SAV1         ?FF59 OLDRST        FF65 MON           FF69 MONZ
 FF73 NXTITM        FF7A CHRSRCH       FF8A DIG           FF90 NXTBIT
 FF98 NXTBAS        FFA2 NXTBS2        FFA7 GETNUM        FFAD NXTCHR
 FFBE TOSUB         FFC7 ZMODE         FFCC CHRTBL        FFE3 SUBTBL
** SUCCESSFUL ASSEMBLY := NO ERRORS
** ASSEMBLER CREATED ON 05-JAN-82 000004
** TOTAL LINES ASSEMBLED  1438
** FREE SPACE PAGE COUNT   67
    2  BJS SRC2
```

80-Column Firmware Listing

```
0000:                 2 ****************************************
0000:                 3 *
0000:                 4 * Apple //e VIDEO FIRMWARE
0000:                 5 *
0000:                 6 * RICK AURICCHIO 08/81
0000:                 7 *
0000:                 8 * (C) 1981, APPLE COMPUTER INC
0000:                 9 *      ALL RIGHTS RESERVED
0000:                10 *
0000:                11 ****************************************
0000:                12 *
0000.  0006          13 GOODF8       EQU   6             ;F8 ROM VERSION
0000:                14 *
0000:                15 * HARDWARE EQUATES
0000:                16 *
0000:  C000          17 KBD          EQU   $C000         ;KEYBOARD PORT
0000:  C000          18 CLR80COL     EQU   $C000         ;DISABLE 80COL STORE
0000.  C001          19 SET80COL     EQU   $C001         ;ENABLE 80COL STORE
0000.  C002          20 RDMAINRAM    EQU   $C002         ;READ MAINBOARD RAM
0000:  C003          21 RDCARDRAM    EQU   $C003         ;READ CARD RAM
0000:  C004          22 WRMAINRAM    EQU   $C004         ;WRITE MAINBOARD RAM
0000:  C005          23 WRCARDRAM    EQU   $C005         ;WRITE CARD RAM
0000:  C007          24 SETINTCXROM  EQU   $C007         ;SET INTERNAL CX00 ROM
0000:  C008          25 SETSTDZP     EQU   $C008         ;SET STD ZP/STK
0000:  C009          26 SETALTZP     EQU   $C009         ;SET ALT ZP/STK
0000:  C00B          27 SETSLOTC3ROM EQU   $C00B
0000:  C00C          28 CLR80VID     EQU   $C00C         ;DISABLE 80COL VIDEO
0000:  C00D          29 SET80VID     EQU   $C00D         ;ENABLE 80COL VIDEO
0000:  C00E          30 CLRALTCHAR   EQU   $C00E         ;NORM LC, FLASH UC
0000.  C00F          31 SETALTCHAR   EQU   $C00F         ;NORM/INV LC, NO FLASH
0000:  C010          32 KBDSTRB      EQU   $C010         ;CLEAR STROBE
0000:  C011          33 RDLCBNK2     EQU   $C011         ;READS LC BANK2
0000.  C012          34 RDLCRAM      EQU   $C012         ;READS LC RAM ENABLE
0000:  C013          35 RDRAMRD      EQU   $C013         ;READS RAMREAD STATE
0000:  C014          36 RDRAMWRT     EQU   $C014         ;READS BANKWRT STATE
0000:  C018          37 RD80COL      EQU   $C018         ;READS SET80COL
0000:  C019          38 RDVBLBAR     EQU   $C019         ; ~VBL SIGNAL
0000:  C01A          39 RDTEXT       EQU   $C01A         ;READS TXT MODE
0000:  C01C          40 RDPAGE2      EQU   $C01C         ;PAGE1/2 STATUS
0000:  C01F          41 RD80VID      EQU   $C01F         ;READS SET80VID
0000:  C030          42 SPKR         EQU   $C030         ;TOGGLE SPEAKER
0000.  C054          43 TXTPAGE1     EQU   $C054         ;PAGE1 TEXT
0000:  C055          44 TXTPAGE2     EQU   $C055         ;PAGE2 TEXT
0000:                45 *
0000:                46 * MONITOR EQUATES
0000:                47 *
0000:  FBB3          48 F8VERSION    EQU   $FBB3         ;F8 ROM ID
0000:  FD0C          49 RDKEY        EQU   $FD0C         ;GET A KEYSTROKE
0000:  FE89          50 SETKBD       EQU   $FE89         ;IN#0
0000:  FE93          51 SETVID       EQU   $FE93         ;PR#0
0000.  FF58          52 IORTS        EQU   $FF58         ;KNOWN RTS
0000:                54 * ZEROPAGE EQUATES
0000.                55 *
0000.                56              DSECT
001F.  001F          57              ORG   $1F
001F:  0001          58 YSAV1        DS    1             ;SAFE PLACE IN ALL ENVIRONS
D020:  0001          59 WNDLFT       DS    1             ;SCROLLING WINDOW LEFT
0021:  0001          60 WNDWDTH      DS    1             ;SCROLLING WINDOW WIDTH
0022:  0001          61 WNDTOP       DS    1             ;SCROLLING WINDOW TOP
0023:  0001          62 WNDBTM       DS    1             ;SCROLLING WINDOW BOTTOM
0024:  0001          63 CH           DS    1             ;CURSOR HORIZONTAL
0025:  0001          64 CV           DS    1             ;CURSOR VERTICAL
0026:  0002          65              DS    2             ;GBASL
0028:  0002          66 BASL         DS    2             ;BASE ADDRESS
002A:  0029          67 BASH         EQU   BASL+1
002A:  0002          68 BAS2L        DS    2             ;BASE ADDR FOR SCROLL
002C:  002B          69 BAS2H        EQU   BAS2L+1
0032:  0032          70              ORG   $32
0032:  0001          71 INVFLG       DS    1             ;>127=NORMAL
0033:  0003          72              DS    3             ;N/A
0036:  00D2          73 CSWL         DS    2             ;COUT HOOK
0038:  0037          74 CSWH         EQU   CSWL+1
D038:  0002          75 KSWL         DS    2             ;KEYIN HOOK
003A:  0039          76 KSWH         EQU   KSWL+1
003C:  003C          77              ORG   $3C
003C:  DDD2          78 A1L          DS    2             ;MONITOR TEMPS FOR MOVE
```

```
003E:          003D    79 A1H          EQU   A1L+1
003E:          0002    80 A2L          DS    2
0040:          003F    81 A2H          EQU   A2L+1
0040:          0002    82              DS    2             ;A3 NOT USED
0042:          0002    83 A4L          DS    2
0044:          0043    84 A4H          EQU   A4L+1
004E:          004E    85              ORG   $4E
004E:          0002    86 RNDL         DS    2             ;RANDOM NUMBER SEED
0050:          0050    87 RNDH         EQU   RNDL+1
00D0:                  88              DEND
0000:                  90 * PERMANENT DATA IN SCREENHOLES
0000:                  91 *
0000:                  92 * NOTE: THESE RESIDE IN PAGE 1 OF
00D0:                  93 *  THE 80-COLUMN SCREEN PAIR; ANY
0000:                  94 *  ROUTINE WHICH SETS PAGE2 *MUST*
0000                   95 *  RESTORE BACK TO PAGE1 SO THAT
0000                   96 *  WE CAN CORRECTLY ACCESS THESE
00D0.                  97 *  PERMS. UNDER *NO* CIRCUMSTANCES
0000:                  98 *  IS ANY ROUTINE TO BE CALLED WHILE
0000:                  99 *  WE HAVE PAGE2 BANKED IN!
0000.                 100 *
0000:          0478   101 TEMP1        EQU   $478          ;A TEMP
0000           047B   102 OLDCH        EQU   $478+3        ;OLD CH SET FOR USER
0000:          04FB   103 MODE         EQU   $4F8+3        ;OPERATING MODE
0000                  104 * MODE BITS
0000                  105 * 0  .  .  . - ESC-R INACTIVE
0000:                 106 * 1.  .  .  - ESC-R ACTIVE
00D0:                 107 *  0. . .   - BASIC PRINT
00D0:                 108 * .1.      - BASIC INPUT
0000.                 109 * . .0 . .  - LANGUAGE=BASIC
0000:                 110 * . .1. . . - LANGUAGE=PASCAL
0000                  111 *    0 . . - U/C RESTRICT MODE
0000                  112 *   .1 .   - LITERAL UC/LC MODE
0000                  113 *  . . 0   - GOTOXY N/A
0000:                 114 * .   1    - GOTOXY IN PROGRESS
0000:                 115 *  . . 0   - NORMAL  VIDED (PASCAL)
0000                  116 *      1   - INVERSE VIDEO (PASCAL)
0000                  117 *    .  0  - PASCAL 1.1 F/W ACTIVE
0000                  118 *  .    1  - PASCAL 1.0 INTERFACE
0000                  119 *  .   D   - CALLER SET'D (BASIC)
0000                  120 *  . . .1  - CALLER CLR'D (BASIC)
0000.                 121 *        0 - NORMAL MODE (PASCAL)
0000                  122 *        1 - TRANSPARENT MODE (PASCAL)
0000           0080   123 M.ESCR       EQU   $80           ;ESC-R ACTIVE
0000:          0040   124 M.BINPUT     EQU   $40           ;BASIC INPUTTING
0000           0020   125 M.PASCAL     EQU   $20           ;PASCAL RUNNING
0000.          0010   126 M.LIT        EQU   $10           ;LITERAL UC/LC INPUT
0000:          0008   127 M.GDXY       EQU   $08           ;GOTOXY IN PROGRESS
0000.          0004   128 M.VMODE      EQU   $04           ;PASCAL VIDED MODE
0000.          0002   129 M.PAS1.0     EQU   $02           ;PASCAL 1.0 MODE
0000:          0001   130 M.IRQ        EQU   $01           ;IRQ ENABLED (BASIC ONLY)
0000:          0001   131 M.TRANS      EQU   $01           ;TRANSPARENT MODE IF F/W PROTOCOL
0000:          057B   132 OURCH        EQU   $578+3        ;80-COL CH
0000           05FB   133 OURCV        EQU   $5F8+3        ;CURSOR VERTICAL
0000.          067B   134 CHAR         EQU   $678+3        ;IN/OUT CHAR
0000:          06FB   135 XCOORD       EQU   $6F8+3        ;X-COORD (GOTOXY)
0000           077B   136 OLDBASL      EQU   $778+3        ;PASCAL SAVED BASL
0000           07FB   137 OLDBASH      EQU   $7F8+3        ;PASCAL SAVED BASH
0000.                 138 *
0000.                 139 * GENERAL SCREEN STUFF
0000                  140 *
0000.          07FB   141 CBSLOT       EQU   $7FB          ;IRQ CB PROTOCOL
0000                  142               CHR   '-'
0000                    4               INCLUDE BFUNC
----- NEXT OBJECT FILE NAME IS VIDED.OBJ0
C100:          C100     2              ORG   $C100
C100           C100     3 BFUNCPG      EQU   *
C100.          FD29     4 FUNCEXIT     EQU   $FD29         ;RETURN ADDRESS
C100:          FBC1     5 F.BASCALC    EQU   $FBC1
C100           FC22     6 F.VTAB       EQU   $FC22
C100           FC24     7 F.VTABZ      EQU   $FC24
C100                    8 ---------------------------------------
C100                    9 * BASIC FUNCTION HOOK
C100                   10 ---------------------------------------
C100                   11 * THIS ROUTINE IS CALLED BY THE
C100                   12 *  PATCHED FB ROM
C100                   13 *  THIS CODE WILL ALWAYS PERFORM THE
C100                   14 *  FUNCTION HERE AND RETURN TO THE
C100                   15 *  CALLER
C100                   16 *
C100                   17 * NOTE  FB ROM DISABLES I/O TO GET US
C100                   18 *  RUNNING HERE  WE RETURN TO FB SPACE
C100                   19 ---------------------------------------
C100                   20 * INPUT  Y=FUNCTION AS FOLLOWS
C100                   21 *          0=CLREOP
C100                   22 *          1=HOME
C100                   23 *          2=SCROLL
C100                   24 *          3=CLREOL
C100                   25 *          4=CLEDLZ
C100                   26 *          5=INIT & RESET
C100                   27 *          6=KEYIN
C100.                  28 *          7=FIX ESCAPE CHAR
```

```
C100.                    29 *           8=SETWND
C100:                    30 *
C100:                    31 *        STK HAS PHP FOR STATUS
C100:                    32 *          OF BANK & IRQ BIT
C100:                    33 * VOLATILE: AC,Y
C100:                    34 ----------------------------------------
C100:                    35 * NOTE:  IF WE HAVE A CARD INSTALLED,
C100                     36 *  THEN USE THE VIDEO ROUTINES, SINCE
C100:                    37 *  WE 'OWN' SLOT3 SCREENHOLES.
C100:                    38 * IF NOT, DUPLICATE F8ROM ROUTINES
C100:                    39 *  AND AVOID SLOT3 INTERFERENCE.
C100:                    40 ----------------------------------------
C100:                    41 * VECTOR TO KEYIN/ESCFIX IMMEDIATELY
C100:                    42 *  TO AVOID AC DESTRUCTION
C100.                    43 *
C100          C100       44 B.FUNC        EQU   *
C100: C0 06              45               CPY   #6              ;IS IT KEYIN?
C102: D0 03   C107       46               BNE   B.FUNCNK        ;NO
C104: 4C 88 C2           47               JMP   B.KEYIN
C107:         C107       48 B.FUNCNK      EQU   *
C107: C0 07              49               CPY   #7              ;IS IT ESCAPE-FIX?
C109: D0 03   C10E       50               BNE   B.FUNCNE        ;NO
C10B: 4C 6E C2           51               JMP   B.ESCFIX        ;=>YES!
C10E:         C10E       52 B.FUNCNE      EQU   *
C10E: 98                 53               TYA                   ;SAVE Y
C10F: 48                 54               PHA
C110: 20 24 CB           55               JSR   TESTCARD        ;DO WE HAVE A CARD?
C113: D0 0A   C11F       56               BNE   B.OLDFUNC       ;=>NO
C115:                    57 *
C115:                    58 * NOTE:  THIS TEST COULD TURN OUT
C115:                    59 *  WRONG ON POWER-UP, SINCE THE
C115:                    60 *  MODEBYTE IS UNDEFINED.  HOWEVER,.
C115:                    61 *  SINCE THE MONITOR IS DOING A
C115:                    62 *  SIMPLE 'SETWND' CALL, WE WON'T
C115:                    63 *  GET INTO TROUBLE EVEN IF WE
C115:                    64 *  MAKE THE WRONG DECISION..
C115:                    65 *
C115: AD FB 04           66               LDA   MODE            ;IS MODE VALID?
C118: 29 28              67               AND   #M.PASCAL+M.GOXY ; FOR BASIC
C11A: D0 03   C11F       68               BNE   B.OLDFUNC       ;=>DEFINITELY NOT!
C11C: 4C A4 C1           69               JMP   B.FUNCO         ;=>YES, GO NEW WAY
C11F.                    70 *
C11F:                    71 * NO CARD.  DO THINGS THE OLD WAY.
C11F:                    72 *
C11F.         C11F       73 B.OLDFUNC     EQU   *
C11F: 68                 74               PLA
C120: A8                 75               TAY                   ;RESTORE Y
C121: A9 C1              76               LDA   #CBFUNCPG       ;TRANSFER VIA
C123: 48                 77               PHA                   ; THE RTS-TRICK
C124: B9 EA CF           78               LDA   F.TABLE,Y       ;GET LO ADDRESS
C127. 48                 79               PHA
C128: 60                 80               RTS                   ;TRANSFER TO ROUTINE
C129.                    81 ----------------------------------------
C129: A4 24              82 F.CLREOP      LDY   CH              ; ESC F IS CLR TO END OF PAGE
C12B: A5 25              83               LDA   CV
C12D: 48                 84 CLEOP1        PHA
C12E: 20 24 FC           85               JSR   F.VTABZ
C131: 20 F4 C2           86               JSR   X.CLEOLZ
C134: A0 00              87               LDY   #$00
C136: 68                 88               PLA
C137: 69 00              89               ADC   #$00
C139: C5 23              90               CMP   WNDBTM
C13B: 90 F0   C12D       91               BCC   CLEOP1
C13D: 20 22 FC           92               JSR   F.VTAB
C140: 4C EB C2           93               JMP   F.RETURN        ;DONE
C143:                    94 ----------------------------------------
C143: A5 22              95 F.HOME        LDA   WNDTOP
C145: 85 25              96               STA   CV
C147: A0 00              97               LDY   #$00
C149: 84 24              98               STY   CH
C14B: F0 E0   C12D       99               BEQ   CLEOP1          ;(ALWAYS TAKEN)
C14D:                   100 ----------------------------------------
C14D: A5 22             101 F.SCROLL      LDA   WNDTOP
C14F: 48                102               PHA
C150: 20 24 FC          103               JSR   F.VTABZ
C153: A5 28             104 SCRL1         LDA   BASL
C155: 85 2A             105               STA   BAS2L
C157: A5 29             106               LDA   BASH
C159: 85 2B             107               STA   BAS2H
C15B: A4 21             108               LDY   WNDWDTH
C15D: 88                109               DEY
C15E: 68                110               PLA
C15F: 69 01             111               ADC   #$01
C161: C5 23             112               CMP   WNDBTM
C163: B0 0D   C172      113               BCS   SCRL3
C165: 48                114               PHA
C166: 20 24 FC          115               JSR   F.VTABZ
C169: B1 28             116 SCRL2         LDA   (BASL),Y
C16B: 91 2A             117               STA   (BAS2L),Y
C16D: 88                118               DEY
C16E: 10 F9   C169      119               BPL   SCRL2
```

```
C170: 30 E1    C153  120               BMI   SCRL1
C172: A0 00          121 SCRL3         LDY   #$00
C174: 20 F4 C2       122               JSR   X.CLEOLZ
C177: 20 22 FC       123               JSR   F.VTAB
C17A: 4C EB C2       124               JMP   F.RETURN      ;=>DONE
C17D: A4 24          125 F.CLREOL      LDY   CH
C17F: A9 A0          126               LDA   #$A0
C181: 91 28          127 CLEOL2        STA   (BASL),Y
C183: C8             128               INY
C184: C4 21          129               CPY   WNDWDTH
C186: 90 F9    C181  130               BCC   CLEOL2
C188: B0 17    C1A1  131               BCS   F.GORET       ;DONE (ALWAYS TAKEN)
C18A:                132 ----------------------------------------
C18A:          C18A  133 F.SETWND      EQU   *
C18A: A9 28          134               LDA   #40
C18C: 85 21          135               STA   WNDWDTH
C18E: A9 18          136               LDA   #24
C190: 85 23          137               STA   WNDBTM
C192: A9 17          138               LDA   #23
C194: 85 25          139               STA   CV
C196: 20 22 FC       140               JSR   F.VTAB
C199: 4C EB C2       141               JMP   F.RETURN
C19C:                142 ----------------------------------------
C19C:          C19C  143 F.CLEOLZ      EQU   *
C19C: A4 1F          144               LDY   YSAV1         ;RESTORE HORIZ POSITION
C19E: 20 F4 C2       145               JSR   X.CLEOLZ      ;DO IT
C1A1: 4C EB C2       146 F.GORET       JMP   F.RETURN      ;DONE
C1A4:          C1A4  148 B.FUNCO       EQU   *
C1A4: 68             149               PLA                 ;RESTORE Y
C1A5: A8             150               TAY
C1A6:                151 *
C1A6:                152 * SET IRQMODE:
C1A6:                153 *
C1A6: AD FB 04       154               LDA   MODE          ;ASSUME IRQ IS DISABLED
C1A9: 29 FE          155               AND   #$FF-M.IRQ
C1AB: 8D FB 04       156               STA   MODE
C1AE: 68             157               PLA                 ;PULL CXBANK STATUS
C1AF: 8D 78 04       158               STA   TEMP1         ; OFF STACK
C1B2: 68             159               PLA                 ;GET USER'S PSTATUS
C1B3: 48             160               PHA                 ; (LEAVE ALONE ON STACK)
C1B4: 4A             161               LSR   A             ;MOVE 'I' BIT TO
C1B5: 4A             162               LSR   A             ; THE CARRY
C1B6: 4A             163               LSR   A
C1B7: AD 78 04       164               LDA   TEMP1         ;PUT CXBANK STATUS
C1BA: 48             165               PHA                 ; BACK ON STACK
C1BB: B0 0B    C1C5  166               BCS   NOI           ;=>HE'S INHIBITED
C1BD: AD FB 04       167               LDA   MODE
C1C0: 09 01          168               ORA   #M.IRQ
C1C2: 8D FB 04       169               STA   MODE
C1C5:          C1C5  170 NOI           EQU   *
C1C5: A5 25          171               LDA   CV            ;COPY USER CV
C1C7: 8D FB 05       172               STA   OURCV         ; TO OURS
C1CA: 4C FF C1       173               JMP   B.VECTOR      ;CONTINUE
C1CD:                174 *
C1CD:                175 * NOTE: THIS KEEPS B.XXXX ROUTINES
C1CD:                176 *  ALL IN THE C100 PAGE...
C1CD:                177 *
C1CD:                178 *
C1CD:          C1CD  179 B.SCROLL      EQU   *
C1CD: 20 A4 CC       180               JSR   SCROLLUP      ;DO IT FOR CALLER
C1D0: 4C EB C2       181               JMP   F.RETURN      ; AND RETURN DIRECTLY
C1D3:                182 *
C1D3:          C1D3  183 B.CLREOL      EQU   *
C1D3: 20 48 CD       184               JSR   X.GS          ;CLEAR TO EOL
C1D6: 4C EB C2       185               JMP   F.RETURN      ;RETURN DIRECTLY TO CALLER
C1D9:                186 ----------------------------------------
C1D9:          C1D9  187 B.CLEOLZ      EQU   *
C1D9: A4 1F          188               LDY   YSAV1         ;RESTORE HORIZ POSITION
C1DB: 20 4E CD       189               JSR   X.GSEOLZ      ;DO IT TO EOL
C1DE: 4C EB C2       190               JMP   F.RETURN
C1E1:                191 ----------------------------------------
C1E1:          C1E1  192 B.CLREOP      EQU   *
C1E1: 20 23 CD       193               JSR   X.VT          ;CLEAR TO EOS
C1E4: 4C EB C2       194               JMP   F.RETURN      ;RETURN DIRECTLY TO CALLER
C1E7:                195 ----------------------------------------
C1E7: 4C 19 C2       196 B.SETWND      JMP   B.SETWNDX
C1EA: 4C 34 C2       197 B.RESET       JMP   B.RESETX      ;MUST BE IN BFUNC PAGE
C1ED:                198 ----------------------------------------
C1ED:          C1ED  199 B.HOME        EQU   *
C1ED: 20 42 CD       200               JSR   X.FF          ;HOME & CLEAR
C1F0: AD 78 05       201               LDA   OURCH
C1F3: 85 24          202               STA   CH            ;COPY CH/CV FOR CALLER
C1F5: 8D 7B 04       203               STA   OLDCH         ;REMEMBER WHAT WE SET
C1F8: AD F8 05       204               LDA   OURCV
C1FB: 85 25          205               STA   CV
C1FD: 10 2F    C22E  206               BPL   GOBACK        ;(ALWAYS TAKEN)
C1FF:                207 *
C1FF:                208 * COPY USER'S CURSOR IF IT DIFFERS
C1FF:                209 *  FROM OURS (AND WE'RE RUNNING
C1FF:                210 *  IN 80-COLUMN MODE).  IF WE ARE
C1FF:                211 *  NOT IN 80-MODE, THEN ALWAYS USE
```

```
C1FF                    212 *  THE USER'S CH VALUE SINCE OURS
C1FF                    213 *  IS PROBABLY INVALID.
C1FF                    214 *
C1FF            C1FF    215 B.VECTOR    EQU   *
C1FF: 20 51 CB          216             JSR   BASCALC
C202: A5 24             217             LDA   CH            ;GET USER CH VALUE
C204: 2C 1F C0          218             BIT   RD80VID       ;DISPLAYING 80-COLS?
C207: 10 05    C20E     219             BPL   B.GETCH       ;=>NO, USER CH IS IT
C209: CD 7B 04          220             CMP   OLDCH         ;IS IT DIFFERENT?
C20C: F0 03    C211     221             BEQ   B FUNC1       ;=>NO, USE OURS
C20E:          C20E     222 B GETCH     EQU   *
C20E: 80 7B 05          223             STA   OURCH         ;USE HIS CH
C211:          C211     224 B FUNC1     EQU   *
C211: A9 C1             225             LDA   #<BFUNCPG     ;TRANSFER TO ROUTINE
C213: 48                226             PHA                 ; VIA RTS-TRICK
C214: B9 F3 CF          227             LDA   B TABLE,Y     ;GET LO ADDRESS
C217: 48                228             PHA
C218: 60                229             RTS
C219.                   230 ----------------------------------------
C219.          C219     231 B SETWNDX   EQU   *
C219: A9 50             232             LDA   #80           ;ASSUME 80-COLS
C21B: 2C 1F C0          233             BIT   RD80VID       ;WHICH MODE?
C21E: 30 01    C221     234             BMI   B.SETWND2     ;=>IT'S 80
C220: 4A                235             LSR   A             ;MAKE IT 40
C221:          C221     236 B SETWND2   EQU   *
C221. 85 21             237             STA   WNDWDTH
C223: A9 18             238             LDA   #24           ;SET BOTTOM
C225. 85 23             239             STA   WNDBTM
C227: A9 17             240             LDA   #23           ;VTAB TO BOTTOM
C229: 8D FB 05          241             STA   OURCV
C22C: 85 25             242             STA   CV
C22E. 20 51 CB          243 GOBACK      JSR   BASCALC
C231: 4C EB C2          244             JMP   F.RETURN
C234:                   245 *
C234.                   246 * HANDLE RESET FOR MONITOR:
C234.                   247 *
C234           C234     248 B.RESETX    EQU   *
C234. A9 FF             249             LDA   #$FF          ;DESTROY MODE BYTE
C236: 8D FB 04          250             STA   MODE
C239 AD 5D C0           251             LDA   $C05D         ;SETUP
C23C. AD 5F C0          252             LDA   $C05F         ; ANNUNCIATORS
C23F                    253 *
C23F.                   254 * IF THE OPEN APPLE KEY
C23F                    255 *  (ALIAS PADDLE BUTTONS 0) IS
C23F                    256 *  DEPRESSED, COLDSTART THE SYSTEM
C23F                    257 *  AFTER DESTROYING MEMORY
C23F:                   258 *
C23F: AD 62 C0          259             LDA   $C062         ;GET BUTTON 1 (SOLID)
C242: 30 1D    C261     260             BMI   DIAGS         ;=>DOWN, DO DIAGS
C244: AD 61 C0          261             LDA   $C061         ;GET BUTTON 0 (OPEN)
C247: 10 1B    C264     262             BPL   RESETRET      ;=>NOT UP OR DIAGS
C249:                   263 *
C249:                   264 * BLAST 2 BYTES OF EACH PAGE,
C249:                   265 *  INCLUDING THE RESET VECTOR:
C249:                   266 *
C249: A0 B0             267             LDY   #$B0          ;LET IT PRECESS DOWN
C24B: A9 00             268             LDA   #0
C240: 85 3C             269             STA   A1L
C24F: A9 BF             270             LDA   #$BF          ;START FROM BFXX DOWN
C251: 38                271             SEC                 ;FOR SUBTRACT
C252:          C252     272 BLAST       EQU   *
C252: 85 3D             273             STA   A1H
C254: 91 3C             274             STA   (A1L),Y
C256: 88                275             DEY
C257: 91 3C             276             STA   (A1L),Y
C259: E9 01             277             SBC   #1            ;BACK DOWN TO NEXT PAGE
C258: C9 01             278             CMP   #1            ;STAY AWAY FROM STACK!
C250: D0 F3    C252     279             BNE   BLAST
C25F: F0 03    C264     280             BEQ   RESETRET      ;(ALWAYS)
C261.                   281 *
C261:          C261     282 DIAGS       EQU   *
C261. 4C 01 C4          283             JMP   $C401         ;RUN DIAGS
C264:                   284 *
C264:          C264     285 RESETRET    EQU   *
C264: 20 24 CB          286             JSR   TESTCARD      ;CARD PLUGGED IN?
C267: F0 14    C27D     287             BEQ   GORETN        ;=>YES
C269: 8D 0B C0          288             STA   SETSLOTC3ROM  ;NO, DISABLE ROM
C26C: D0 0F    C27D     289             BNE   GORETN        ;(ALWAYS TAKEN)
C26E:                   290 ----------------------------------------
C26E:          C26E     291 B.ESCFIX    EQU   *
C26E: 29 DF             292             AND   #$DF          ;FORCE TO UPPERCASE
C270: A0 03             293             LDY   #4-1          ;SCAN FOR A MATCH
C272:          C272     294 B.ESCFIX2   EQU   *
C272: D9 B0 C2          295             CMP   ESCIN,Y       ;IS IT?
C275: D0 03    C27A     296             BNE   B.ESCFIX3     ;=>NAW
C277: B9 B4 C2          297             LDA   ESCOUT,Y      ;YES, TRANSLATE IT
C27A:          C27A     298 B.ESCFIX3   EQU   *
C27A: 88                299             DEY
C27B: 10 F5    C272     300             BPL   B.ESCFIX2
C27D: 4C EB C2          301 GORETN      JMP   F.RETURN      ;RETURN: CHAR IN AC
C280:                   302 ----------------------------------------
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C280: 88 95 8A 8B   303 ESC1N       DFB   $88,$95,$8A,$8B
C284: CA CB CD C9   304 ESCDUT      ASC   'JKMI'          ;THE ARRDWS
C288:               305 ----------------------------------------
C288:         C288  306 B.KEYIN     EQU   *
C288: 8D 78 04      307             STA   TEMP1           ;SAVE DRIGINAL CHAR
C28B: 68            308             PLA                   ;HOLD DNTD
C28C: A8            309             TAY                   ; CXBANK STATUS
C28D: 68            310             PLA                   ;GET USER'S
C28E: 48            311             PHA                   ; IRQ STATE
C28F: 6A            312             ROR   A               ;MOVE IRQ BIT TO
C290: 6A            313             ROR   A               ; THE
C291: 6A            314             ROR   A               ;  CARRY
C292: 98            315             TYA                   ;PUT CXBANK STATUS
C293: 48            316             PHA                   ; BACK ON STACK
C294: 8A            317             TXA                   ;SAVE
C295: 48            318             PHA                   ; XREG
C296:               319 *
C296: B8            320             CLV                   ;ASSUME NOT INTERRUPTIBLE
C297: B0 03   C29C  321             BCS   B.KEYIN2        ;=>WE WERE RIGHT
C299: 2C 00 CF      322             BIT   SEV             ;SAY "INTERRUPTIBLE"
C29C:         C29C  323 B.KEYIN2    EQU   *
C29C: A9 FF         324             LDA   #$FF            ;CURSOR=NORMAL DELETE
C29E: A4 24         325             LDY   CH
C2A0: 91 28         326             STA   (BASL),Y
C2A2: 20 C6 C2      327             JSR   KEYDLY          ;WAIT FOR A KEY
C2A5: B0 0E   C2B5  328             BCS   GOTKEY          ;=>GOT ONE
C2A7: AD 78 04      329             LDA   TEMP1           ;REPLACE ORIG CHAR
C2AA: A4 24         330             LDY   CH
C2AC: 91 28         331             STA   (BASL),Y
C2AE: 20 C6 C2      332             JSR   KEYDLY          ;WAIT FOR A KEY
C2B1: B0 02   C2B5  333             BCS   GOTKEY          ;=>GOT ONE
C2B3: 90 E7   C29C  334             BCC   B.KEYIN2        ;(ALWAYS TAKEN)
C2B5:               335 *
C2B5:         C2B5  336 GOTKEY      EQU   *
C2B5: AD 78 04      337             LDA   TEMP1           ;RESTORE ORIGINAL
C2B8: A4 24         338             LDY   CH
C2BA: 91 28         339             STA   (BASL),Y        ; CHARACTER
C2BC: 68            340             PLA                   ;RESTORE
C2BD: AA            341             TAX                   ; XREG
C2BE: AD 00 C0      342             LDA   KBD             ;GET THE NEW KEYSTROKE
C2C1: 8D 10 C0      343             STA   KBDSTRB         ;CANCEL THE STROBE
C2C4: 30 25   C2EB  344             BMI   F.RETURN        ;(ALWAYS TAKEN)
C2C6:               345 ***
C2C6:               346 *** INPUT: VFLAG SET IF INTERRUPTIBLE
C2C6:         C2C6  347 KEYDLY      EQU   *
C2C6: A2 0C         348             LDX   #$0C            ;SHORT DELAY FOR IRQ
C2C8: 70 02   C2CC  349             BVS   IK1             ;->INTERRUPTIBLE
C2CA: A2 31         350             LDX   #$31            ;LONG  DELAY FOR NO IRQ
C2CC:         C2CC  351 IK1         EQU   *
C2CC: A0 00         352             LDY   #0
C2CE:         C2CE  353 IK2         EQU   *
C2CE: 50 05   C2D5  354             BVC   IK2A            ;=>NOT INTERRUPTIBLE
C2D0: 08            355             PHP                   ;SAVE DFLDW
C2D1: 20 75 FC      356             JSR,  SNIFFIRQ        ;ALLOW IRQ
C2D4: 28            357             PLP                   ;RESTORE DFLDW
C2D5:         C2D5  358 IK2A        EQU   *
C2D5: E6 4E         359             INC   RNDL
C2D7: D0 02   C2DB  360             BNE   IK3
C2D9: E6 4F         361             INC   RNDH
C2DB:         C2DB  362 IK3         EQU   *
C2DB: AD 00 C0      363             LDA   KBD             ;KEYPRESS?
C2DE: 30 09   C2E9  364             BMI   KDRETY          ;=>YES
C2E0: 88            365             DEY
C2E1: D0 EB   C2CE  366             BNE   IK2
C2E3: CA            367             DEX
C2E4: D0 E6   C2CC  368             BNE   IK1
C2E6:         C2E6  369 KDRETN      EQU   *
C2E6: 18            370             CLC
C2E7: 90 01   C2EA  371             BCC   KDRET
C2E9:         C2E9  372 KDRETY      EQU   *
C2E9: 38            373             SEC
C2EA:         C2EA  374 KDRET       EQU   *
C2EA: 60            375             RTS
C2EB:               376 *
C2EB:               377 * EXIT. EITHER EXIT WITH OR WITHOUT
C2EB:               378 *  ENABLING I/O SPACE.
C2EB:               379 *
C2EB:         C2EB  380 F.RETURN    EQU   *
C2EB: 28            381             PLP                   ;GET PRIOR I/O DISABLE
C2EC: 30 03   C2F1  382             BMI   F.RET1          ;=>LEAVE IT DISABLED
C2EE: 4C 29 FD      383             JMP   FUNCEXIT        ;=>EXIT & ENABLE I/O
C2F1: 4C 2C FD      384 F.RET1      JMP   FUNCEXIT+3      ;EXIT DISABLED
C2F4:               385 ----------------------------------------
C2F4:         C2F4  386 X.CLEOLZ    EQU   *
C2F4: A9 A0         387             LDA   #$A0
C2F6:         C2F6  388 X.CLEOL2    EQU   *
C2F6: 91 28         389             STA   (BASL),Y
C2F8: C8            390             INY
C2F9: C4 21         391             CPY   WNDWDTH
C2FB: 90 F9   C2F6  392             BCC   X.CLEOL2
C2FD: 60            393             RTS                   ;ALWAYS RETURN DIRECTLY
C2FE:         0002  394 ZSPAREC2    EQU   $C300-*
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```
C2FE:          00D2  395              DB    $C300-*,0
C300:                  5              INCLUDE C3SPACE
C300:                  2 ----------------------------------------
C300:                  3 *
C300:                  4 * THIS IS THE $C3XX ROM SPACE:
C300:                  5 *
C300:                  6 ----------------------------------------
C300:          C300    7 CN00         EQU   *
C300:          C300    8 BASICINT     EQU   *
C300: 2C 58 FF         9              BIT   IORTS          ;SET VFLAG (INIT)
C303: 70 12    C317   10              BVS   BASICENT       ;(ALWAYS TAKEN)
C305:          C3D5   11 BASICIN      EQU   *
C305: 38               12              SEC
C306: 90               13              DFB   $90            ;BCC OPCODE (NEVER TAKEN)
C307:          C307   14 BASICOUT     EQU   *
C307: 18               15              CLC
C308: B8               16              CLV                  ;CLEAR VFLAG (NOT INIT)
C309: 50 0C    C317   17              BVC   BASICENT       ;(ALWAYS TAKEN)
C30B:                 18 *
C30B:                 19 * PASCAL 1.1 FIRMWARE PROTOCOL TABLE:
C30B:                 20 *
C30B: 01              21              DFB   $01            ;GENERIC SIGNATURE BYTE
C30C: 88              22              DFB   $88            ;DEVICE SIGNATURE BYTE
C30D:                 23 *
C300: 4B              24              DFB   >JPINIT        ;PASCAL INIT
C30E: 51              25              DFB   >JPREAD        ;PASCAL READ
C30F: 57              26              DFB   >JPWRITE       ;PASCAL WRITE
C310: 5D              27              DFB   >JPSTAT        ;PASCAL STATUS
C311:                 28 ----------------------------------------
C311:                 29 *
C311:                 30 * 128K SUPPORT ROUTINE ENTRIES:
C311:                 31 *
C311: 4C 63 C3        32              JMP   MOVE           ;MEMORY MOVE ACROSS BANKS
C314: 4C B0 C3        33              JMP   XFER           ;TRANSFER ACROSS BANKS
C317:                 34 ----------------------------------------
C317:                 35 * BASIC I/O ENTRY POINT:
C317:                 36 ----------------------------------------
C317:          C317   37 BASICENT     EQU   *
C317: 8D 7B 06        38              STA   CHAR           ;SAVE CHARACTER
C31A: 48              39              PHA                  ;SAVE AC
C31B: 98              40              TYA                  ;  AND Y
C31C: 48              41              PHA
C31D: 8A              42              TXA                  ;  AND X
C31E: 48              43              PHA
C31F: 08              44              PHP                  ;SAVE CARRY & VFLAG
C320:                 45 *
C320:                 46 * SET IRQMODE:
C320:                 47 *
C320: AD FB 04        48              LDA   MODE           ;ASSUME IRQ IS DISABLED
C323: 29 FE           49              AND   #255-M.IRQ
C325: 8D FB 04        50              STA   MODE
C328: 68              51              PLA                  ;GET PSTATUS
C329: 48              52              PHA                  ;  AND LEAVE ON STACK
C32A: 29 04           53              AND   #$04           ;IS 'I' BIT SET?
C32C: D0 08    C336   54              BNE   BASICENT2      ;=>YES, DISABLED
C32E: AD FB 04        55              LDA   MODE
C331: 09 01           56              ORA   #M.IRQ
C333: 8D FB 04        57              STA   MODE           ;SET IT ENABLED
C336:          C336   58 BASICENT2    EQU   *
C336: AD FF CF        59              LDA   $CFFF          ;KICK OUT ALL CX ROMS
C339: A5 25           60              LDA   CV             ;GET USER CV AND
C33B: 8D F8 05        61              STA   OURCV          ;  STUFF IT FOR US
C33E: 20 EB C3        62              JSR   SETCX          ;SETUP CX INDICATOR
C341: 28              63              PLP                  ;GET VFLAG (INIT)
C342: 08              64              PHP
C343: 70 03    C348   65              BVS   JBASINIT       ;=>DO THE INIT
C345: 4C 66 C8        66              JMP   CXBASIC        ;GET OUT OF CN SPACE
C348: 4C 03 C8        67 JBASINIT     JMP   BASICINIT      ;=>GOTO CX SPACE
C348:                 68 *
C348:          C348   69 JPINIT       EQU   *
C348: 20 EB C3        70              JSR   SETCX          ;SETUP CX INDICATOR
C34E: 4C 4F CA        71              JMP   PINIT          ;XFER TO PASCAL INIT
C351:          C351   72 JPREAD       EQU   *
C351: 20 EB C3        73              JSR   SETCX          ;SETUP CX INDICATOR
C354: 4C 74 CA        74              JMP   PREAD          ;XFER TO PASCAL READ
C357:          C357   75 JPWRITE      EQU   *
C357: 20 EB C3        76              JSR   SETCX          ;SETUP CX INDICATOR
C35A: 4C 8E CA        77              JMP   PWRITE         ;XFER TO PASCAL WRITE
C35D:          C35D   78 JPSTAT       EQU   *
C35D: 20 EB C3        79              JSR   SETCX          ;SETUP CX INDICATOR
C360: 4C 94 C9        80              JMP   PSTATUS        ;XFER TO PASCAL STATUS
C363:                 82 ----------------------------------------
C363:                 83 * NAME      : MOVE
C363:                 84 * FUNCTION: PERFORM CROSSBANK MEMORY MOVE
C363:                 85 * INPUT     : A1=SOURCE ADDRESS
C363:                 86 *           : A2=SOURCE END
C363:                 87 *           : A4=DESTINATION START
C363:                 88 *           : CARRY SET=MAIN-->CARD
C363:                 89 *                CLR=CARD-->MAIN
C363:                 90 * OUTPUT    : NONE
C363:                 91 * VOLATILE  : NOTHING
```

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C363:                 92 * CALLS    : NOTHING
C363:                 93 ----------------------------------------
C363:                 94 *
C363:          C363   95 MOVE        EQU   *
C363: 48              96             PHA                 ;SAVE AC
C364: 98              97             TYA                 ; AND Y
C365: 48              98             PHA
C366: AD 13 C0        99             LDA   RDRAMRD       ;SAVE STATE OF
C369: 48             100             PHA                 ; MEMORY FLAGS
C36A: AD 14 C0       101             LDA   RDRAMWRT
C36D: 48             102             PHA
C36E:                103 *
C36E:                104 * SET FLAGS FOR CROSSBANK MOVE:
C36E:                105 *
C36E: 90 08   C378   106             BCC   MOVEC2M       ;=>CARD-->MAIN
C370: 8D 02 C0       107             STA   RDMAINRAM     ;SET FOR MAIN
C373: 8D 05 C0       108             STA   WRCARDRAM     ; TO CARD
C376: B0 06   C37E   109             BCS   MOVESTRT      ;=>(ALWAYS TAKEN)
C378:                110 *
C378:          C378  111 MOVEC2M     EQU   *
C378: 8D 04 C0       112             STA   WRMAINRAM     ;SET FOR CARD
C37B: 8D 03 C0       113             STA   RDCARDRAM     ; TO MAIN
C37E:                114 *
C37E:          C37E  115 MOVESTRT    EQU   *
C37E: A0 00          116             LDY   #0            ;DUMMY INDEX
C380:                117 *
C380:          C380  118 MOVELOOP    EQU   *
C380: B1 3C          119             LDA   (A1L),Y       ;GET A BYTE
C382: 91 42          120             STA   (A4L),Y       ;MOVE IT
C384: E6 42          121             INC   A4L
C386: D0 02   C38A   122             BNE   NXTA1
C388: E6 43          123             INC   A4H
C38A: A5 3C          124 NXTA1       LDA   A1L
C38C: C5 3E          125             CMP   A2L
C38E: A5 3D          126             LDA   A1H
C390: E5 3F          127             SBC   A2H
C392: E6 3C          128             INC   A1L
C394: D0 02   C398   129             BNE   CO1
C396: E6 3D          130             INC   A1H
C398: 90 E6   C380   131 CO1         BCC   MOVELOOP      ;=>MORE TO MOVE
C39A:                132 *
C39A:                133 * RESTORE ORIGINAL FLAGS:
C39A:                134 *
C39A: 8D 04 C0       135             STA   WRMAINRAM     ;CLEAR FLAG2
C39D: 68             136             PLA                 ;GET ORIGINAL STATE
C39E: 10 03   C3A3   137             BPL   CO3           ;=>IT WAS OFF
C3A0: 8D 05 C0       138             STA   WRCARDRAM
C3A3:          C3A3  139 CO3         EQU   *
C3A3: 8D 02 C0       140             STA   RDMAINRAM     ;CLEAR FLAG1
C3A6: 68             141             PLA                 ;GET ORIGINAL STATE
C3A7: 10 03   C3AC   142             BPL   MOVERET       ;=>IT WAS OFF
C3A9: 8D 03 C0       143             STA   RDCARDRAM
C3AC:          C3AC  144 MOVERET     EQU   *
C3AC: 68             145             PLA                 ;RESTORE Y
C3AD: A8             146             TAY
C3AE: 68             147             PLA                 ; AND AC
C3AF: 60             148             RTS
C3B0:                149 ----------------------------------------
C3B0:                150 * NAME     : XFER
C3B0:                151 * FUNCTION: TRANSFER CONTROL CROSSBANK
C3B0:                152 * INPUT    : $03E0=TRANSFER ADDR
C3B0:                153 *          : CARRY SET=XFER TO CARD
C3B0:                154 *                CLR=XFER TO MAIN
C3B0:                155 *          : VFLAG CLR=USE STD ZP/STK
C3B0:                156 *          :       SET=USE ALT ZP/STK
C3B0:                157 * OUTPUT   : NONE
C3B0:                158 * VOLATILE: $03E0/03EE IN DEST BANK
C3B0:                159 * CALLS    : NOTHING
C3B0:                160 * NOTE     : ENTERED VIA JMP, NOT JSR
C3B0:                161 ----------------------------------------
C3B0:                162 *
C3B0:          C3B0  163 XFER        EQU   *
C3B0: 48             164             PHA                 ;SAVE AC ON CURRENT STACK
C3B1:                165 *
C3B1:                166 * COPY DESTINATION ADDRESS TO THE
C3B1:                167 *  OTHER BANK SO THAT WE HAVE IT
C3B1:                168 *  IN CASE WE DO A SWAP:
C3B1:                169 *
C3B1: AD E0 03       170             LDA   $03ED         ;GET XFERADDR LO
C3B4: 48             171             PHA                 ;SAVE ON CURRENT STACK
C3B5: AD EE 03       172             LDA   $03FE         ;GET XFERADDR HI
C3B8: 48             173             PHA                 ;SAVE IT TOO
C3B9:                174 *
C3B9:                175 * SWITCH TO APPROPRIATE BANK:
C3B9:                176 *
C3B9: 90 0A   C3C5   177             BCC   XFERC2M       ;=>CARD-->MAIN
C3BB: 8D 03 C0       178             STA   RDCARDRAM     ;SET FOR RUNNING
C3BE: 8D 05 C0       179             STA   WRCARDRAM     ; IN CARD RAM
C3C1: 50 19   C3DC   180             BVC   XFERSZP       ;=>USE STD ZP/STK
C3C3: 70 08   C3CD   181             BVS   XFERAZP       ;=>USE ALT ZP/STK
C3C5:          C3C5  182 XFERC2M     EQU   *
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C3C5: 8D 02 C0      183              STA   RDMAINRAM   ;SET FDR RUNNING
C3C8: 8D 04 C0      184              STA   WRMAINRAM   ;  IN MAIN RAM
C3CB: 50 0F   C3DC  185              BVC   XFERSZP     ;=>USE STO ZP/STK
C3CD:               186 *
C3C0:         C3C0  187 XFERAZP      EQU   *           ;SWITCH TO ALT ZP/STK
C3CD: 68            188              PLA               ;STUFF XFERAODR
C3CE: 8D EE 03      189              STA   $03EE       ;  HI AND
C3D1: 68            190              PLA
C3D2: 8D ED 03      191              STA   $03ED       ;  LO
C3D5: 68            192              PLA               ;RESTORE AC
C3D6: 8D 09 C0      193              STA   SETALTZP    ;SWITCH TO ALT ZP/STK
C3D9: 6C ED 03      194              JMP   ($03ED)     ;=>OFF WE GO!
C3DC:               195 *
C3DC.         C3DC  196 XFERSZP      EQU   *
C3DC: 68            197              PLA               ;STUFF XFERADDR
C3DD: 8D EE 03      198              STA   $03EE       ;  HI AND
C3E0: 68            199              PLA
C3E1: 80 ED 03      200              STA   $03E0       ;  LO
C3E4: 68            201              PLA               ;RESTORE AC
C3E5: 8D 08 C0      202              STA   SETSTDZP    ;=>SWITCH TO STO ZP/STK
C3E8: 6C ED 03      203              JMP   ($03ED)     ;OFF WE GO!
C3EB:               204 ----------------------------------------
C3EB:               205 * NAME     : SETC8
C3EB:               206 * FUNCTION: SETUP IRQ $C800 PROTOCOL
C3EB:               207 * INPUT    : NONE
C3EB.               208 * OUTPUT   : NONE
C3EB:               209 * VOLATILE: NOTHING
C3EB:               210 * CALLS    : NOTHING
C3EB.               211 ----------------------------------------
C3EB                212 *
C3EB.         C3EB  213 SETC8        EQU   *
C3EB: 48            214              PHA               ;SAVE AC
C3EC: A9 C3         215              LDA   #<CCN00     ;SLOT NUMBER
C3EE: 8D F8 07      216              STA   C8SLDT      ;STUFF IT
C3F1: 68            217              PLA               ;RESTORE AC
C3F2: 60            218              RTS
C3F3:                 6              INCLUDE C8SPACE
C3F3.                 2 ----------------------------------------
C3F3:                 3 * THIS IS THE C8XX SPACE:
C3F3.                 4 ----------------------------------------
C3F3.         0000    5              DO    TEST
 S                    6              ORG   $D800
C3F3                  7              ELSE
------ NEXT OBJECT FILE NAME IS VIDEO.OBJ1
C800:         C800    8              ORG   $C800
C800:                 9              FIN
C800: 4C 4A CA       10              JMP   PINIT1.0    ;PASCAL 1.0 INIT
C803:                11 * BASIC INITIALIZATION:
C803.                12 ----------------------------------------
C803:         C803   13 BASICINIT     EQU   *
C803: A9 06          14              LDA   #C0DDF8     ;CHECK F8 ROM
C805: C0 B3 FB       15              CMP   F8VERSION   ;  IS IT OK?
C808: F0 0C   C816   16              BEQ   BINIT1      ;=>YES
C80A: 20 78 CF       17              JSR   COPYROM     ;TRY COPYING TO RAMCARD
C80D: C0 B3 FB       18              CMP   F8VERSION
C810: F0 04   C816   19              BEQ   BINIT1      ;=>NOW IT'S GOOD
C812: 78             20              SEI               ;CRASH THE SYSTEM!
C813:         C813   21 HANG         EQU   *
C813: 4C 13 C8       22              JMP   HANG        ;HANG FOREVER
C816:                23 *
C816:         C816   24 BINIT1       EQU   *
C816: A9 C3          25              LDA   #<CCND0     ;SET HOOKS FOR
C818: 85 37          26              STA   CSWH
C81A: 85 39          27              STA   KSWH        ;  IN & OUT
C81C: A9 05          28              LDA   #>BASICIN
C81E: 85 38          29              STA   KSWL
C820: A9 07          30              LDA   #>BASICOUT
C822: 85 36          31              STA   CSWL
C824: A9 0D          32              LDA   #0          ;SET FULL 40-COL WINDOW
C826: 85 20          33              STA   WNDLFT
C828: A9 00          34              LDA   #0          ;ASSUME TEXT MODE
C82A: 2C 1A C0       35              BIT   RDTEXT      ;IN TEXT MODE?
C82D: 30 02   C831   36              BMI   BINIT1A     ;=>YES
C82F: A9 14          37              LDA   #20         ;IF GR, SET 4 LINES
C831:         C831   38 BINIT1A      EQU   *
C831: 85 22          39              STA   WNDTOP
C833: A9 18          40              LDA   #24
C835: 85 23          41              STA   WNDBTM
C837: A9 28          42              LDA   #40
C839: 85 21          43              STA   WNDWDTH
C83B: A5 24          44              LDA   CH          ;COPY USER CH
C83D: 8D 7B 04       45              STA   OLDCH       ;  AS 'OLD' SETTING
C840: A9 01          46              LDA   #M.IRQ      ;GET READY TO CLEAR
C842: 2D FB 04       47              AND   MODE        ;PRESERVE IRQ STATUS
C845: 80 FB 04       48              STA   MODE        ;CLEAR MODES
C848: 4C 50 C8       49              JMP   BINIT2      ;=>CONTINUE AFTER PASCAL 1.0 HOOK
C84B:                50 ----------------------------------------
C84B:                51 *
C84B:                52 * PASCAL 1.0 INPUT HOOK:
C84B:                53 *
C84B: 00             54              BRK
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C84C:00                 55              BRK
C84D:           0000    56              IFNE  *-$C84D       ;ERR IF WRONG ADDR
 S                      57              FAIL  2,'C84D      HDDK ALIGNMENT'
C84D:                   58              FIN
C84D:4C 51 C3           59              JMP   JPREAD       ;=>GO TO STANDARD READ
C850:                   60 ------------------------------------
C850:                   61 *
C850:                   62 * IS THERE A CARD?
C850:                   63 *
C850:           C850    64 BINIT2       EQU   *
C850:20 24 CB           65              JSR   TESTCARD     ;SEE IF CARD PLUGGED IN
C853:D0 08      C85D    66              BNE   CLEARIT      ;=>IT'S 40
C855:06 21              67              ASL   WNDWDTH      ;SET 80-COL WINDOW
C857:8D 01 C0           68              STA   SETB0COL     ;ENABLE 80 STORE
C85A:8D 0D C0           69              STA   SETB0VID     ; AND 80 VIDEO
C85D:                   70 *
C85D:                   71 * HOME & CLEAR:
C85D:                   72 *
C85D:           C85D    73 CLEARIT      EQU   *
C85D:8D 0F C0           74              STA   SETALTCHAR   ;SET NORM/INV LCASE
C860:20 42 C0           75              JSR   X.FF         ;CLEAR IT
C863:28                 76              PLP                ;CLC ASSURES THAT
C864:18                 77              CLC                ; WE PRINT THIS
C865:08                 78              PHP                ;  INITIAL CHARACTER
C866:                   80 *
C866:                   81 * COMPENSATE FOR INTEGER BASIC'S
C866:                   82 *  HITTING OF $C000 ON INITIAL ENTRY:
C866:                   83 *
C866:           C866    84 C8BASIC      EQU   *            ;BASIC IN/OUT
C866:2C 1F C0           85              BIT   RD80VID      ;WHICH MODE?
C869:10 09      C874    86              DPL   C8D2         ;=>40.  LEAVE ALONE
C86B:8D 01 C0           87              STA   SETB0COL     ;80.  ENABLE STORE.
C86E:                   88 *
C86E:                   89 * MAKE SURE SCROLLING WINDOW IS
C86E:                   90 *  AN EVEN NUMBER FOR 80-COLS:
C86E:                   91 *
C86E:A5 21              92              LDA   WNDWDTH
C870:29 FE              93              AND   #$FE
C872:85 21              94              STA   WNDWDTH      ;ROUND IT TO LOWER EVEN
C874:                   95 *
C874:                   96 * COPY USER'S CH IF IT DIFFERS FROM
C874:                   97 *  WHAT WE LAST PUT THERE:
C874:                   98 *
C874:           C874    99 C8B2         EQU   *
C874:A5 24             100              LDA   CH           ;GET IT
C876:CD 7B 04          101              CMP   OLDCH        ;IS IT THE SAME?
C879:F0 03      C87E   102              BEQ   C8B3         ;=>YES, USE OUR OWN
C87B:80 7D 05          103              STA   OURCH        ;=>NO, USE HIS
C87E:           C87E   104 C8B3         EQU   *
C87E:A9 06             105              LDA   #GOODF8      ;CHECK F8 ROM
C880.CD B3 FB          106              CMP   F8VERSION    ;IF DIFFERENT, USER
C883:F0 0B      C890   107              DEQ   C8B4         ; HAS RELOADED RAMCARD
C885:                  108 *
C885.                  109 * COPY F8 ROM TO LANG CARD:
C885:                  110 *
C885:20 78 CF          111              JSR   COPYROM      ;COPY IT AGAIN
C888.CD B3 FB          112              CMP   F8VERSION    ;IS IT NOW CORRECT?
C88B:F0 03      C890   113              BEQ   C8B4         ;=>GREAT
C88D:4C 13 C8          114              JMP   HANG         ;=>WE HAVE WRONG ROM!
C890:                  115 *
C890.           C890   116 C8B4         EQU   *
C890.28                117              PLP                ;RECOVER CARRY (IN/OUT)
C891:90 03      C896   118              BCC   DOUT         ;=>PRINT A CHAR
C893:4C F6 C8          119              JMP   BINPUT       ;=>INPUT A CHAR
C896:           C896   120 BOUT         EQU   *
C896:AD FB 04          121              LDA   MODE         ;SAY THAT WE'RE
C899.29 BF             122              AND   #255-M.BINPUT ; PRINTING
C89B:8D FB 04          123              STA   MODE
C89E:4C A1 C8          124              JMP   BPRINT       ;->OUTPUT A CHAR
C8A1.                    7              INCLUDE BPRINT
C8A1.                    2 ------------------------------------
C8A1:                    3 * BASIC OUTPUT:
C8A1                     4 ------------------------------------
C8A1:           C8A1     5 BPRINT        EQU   *
C8A1:A0 7D 06            6              LDA   CHAR         ;GET CHARACTER
C8A4:C9 8D               7              CMP   #$8D         ;IS IT C/R?
C8A6:D0 18      C8C0     8              BNE   NOWAIT       ;=>NOPE, NO VIDWAIT
C8A8:AC 00 C0            9              LDY   KBD          ;IS KEY PRESSED?
C8AB.10 13      C8C0    10              BPL   NOWAIT       ;NO
C8A0:C0 93              11              CPY   #$93         ;IS IT CTL-S?
C8AF:00 0F      C8C0    12              BNE   NOWAIT       ;NO, IGNORE IT
C8D1:2C 10 C0           13              DIT   KBDSTRB      ;CLEAR STROBE
C8B4:AC 00 C0           14 KBDWAIT      LDY   KBD          ;WAIT FOR NEXT KEYPRESS
C8B7:10 FB      C8B4    15              DPL   KBDWAIT
C8B9:C0 83              16              CPY   #$83         ;IF CTL-C, LEAVE IT
C8BB.F0 03      C8C0    17              BEQ   NOWAIT       ;  IN THE KDO BUFFER
C8BD:2C 10 C0           18              BIT   KBDSTRB      ;CLEAR OTHER CHARACTER
C8C0:           C8C0    19 NOWAIT       EQU   *
C8C0:29 7F              20              AND   #$7F         ;DROP POSSIBLE HI BIT
C8C2.C9 20              21              CMP   #$20         ;IS IT CONTROL CHAR?
C8C4:D0 06      C8CC    22              BCS   DPNCTL       ;=>NOPE
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C8C6:20 99 CB      23              JSR   CTLCHAR     ;EXECUTE POSSIBLE CTL CHAR
C8C9:4C E2 C8      24              JMP   B1ORET      ;=>EXECUTED OR IGNORED
C8CC:              25 *
C8CC:              26 * NOT A CTL CHAR. PRINT IT.
C8CC:              27 *
C8CC:        C8CC  28 BPNCTL       EQU   *
C8CC:AC 7B 05      29              LDY   OURCH       ;GET CH
C8CF:AD 7B 06      30              LDA   CHAR        ;GET CHAR (ALL 8 BITS)
C8D2:20 F2 CE      31              JSR   STORCHAR    ;STUFF ONTO SCREEN
C8D5:              32 *
C8D5:              33 * BUMP THE CURSOR HORIZONTAL:
C8D5:              34 *
C8D5:EE 7B 05      35              INC   OURCH       ;BUMP IT
C8D8:AD 7B 05      36              LDA   OURCH       ;ARE WE PAST THE
C8DB:C5 21         37              CMP   WNDWDTH     ; END OF THE LINE?
C8DD:90 03   C8E2  38              BCC   BIORET      ;=>NO, NO PROBLEM
C8DF:20 EC CB      39              JSR   X.CR        ;YES, DO C/R
C8E2:              40 *
C8E2:        C8E2  41 BIORET       EQU   *
C8E2:AD 7B 05      42              LDA   OURCH       ;SET CH AND CV
C8E5:20 AF CE      43              JSR   SETCH       ; FOR BASIC
C8E8:AD FB 05      44              LDA   OURCV
C8EB:85 25         45              STA   CV
C8ED:68            46              PLA               ;RESTORE
C8EE:AA            47              TAX
C8EF:68            48              PLA               ;X AND Y
C8F0:A8            49              TAY
C8F1:68            50              PLA               ; AND AC
C8F2:AD 7B 06      51              LDA   CHAR
C8F5:60            52              RTS               ;RETURN TO BASIC
C8F6:               8              INCLUDE BINPUT
C8F6:               2 * BASIC INPUT:
C8F6:               3 *
C8F6:        C8F6   4 BINPUT       EQU   *
C8F6:AD FB 04       5              LDA   MODE        ;SAY THAT
C8F9:09 40          6              ORA   #M.BINPUT   ; WE'RE INPUTTING
C8FB:8D FB 04       7              STA   MODE
C8FE:AD 7B 06       8              LDA   CHAR        ;GET CHAR AT CURSOR AND
C901:A4 24          9              LDY   CH          ;GET CURSOR POSITION
C903:91 28         10              STA   (BASL),Y    ; REPAIR MONITOR'S SILLY ATTEMPT
C905:        C905  11 B.INPUT      EQU   *
C905:20 DD CE      12              JSR   INVERT      ;CREATE OUR OWN CURSOR IMAGE
C908:20 15 CB      13              JSR   GETKEY      ;GET A KEY
C90B:8D 7B 06      14              STA   CHAR        ;SAVE IT
C90E:20 DD CE      15              JSR   INVERT      ;REMOVE CURSOR
C911:C9 9B         16              CMP   #$9B        ;ESCAPE KEY?
C913:F0 03   C918  17              BEQ   ESCAPING    ;=>YES IT IS
C915:4C B7 C9      18              JMP   NOESC       ;=>NO, IT'S NORMAL
C918               20 * START AN ESCAPE SEQUENCE:
C918:              21 *  WE HANDLE THE FOLLOWING ONES:
C918:              22 *    @ - HOME & CLEAR
C918:              23 *    E - CLR TO EOL
C918:              24 *    F - CLR TO EOS
C918:              25 *    I - CURSOR UP
C918:              26 *    J - CURSOR LEFT
C918:              27 *    K - CURSOR RIGHT
C918:              28 *    M - CURSOR DOWN
C918:              29 *    R - RESTRICT TO UPPERCASE
C918:              30 *    T - TURN OFF ESC-R
C918:              31 *    4 - GOTO 40 COLUMN MODE
C918:              32 *    8 - GOTO 80 COLUMN MODE
C918:              33 * CTL-Q- QUIT (PR#0/IN#0)
C918:              34 *   THE FOUR ARROW KEYS (AS IJKM)
C918:              35 *
C918:              36              MSB   OFF
C918:        C918  37 ESCAPING     EQU   *
C918:20 52 CF      38              JSR   ESCON       ;ESCAPE CURSORON
C918:20 15 CB      39              JSR   GETKEY      ;GET ESCAPE FUNCTION
C91E:20 65 CF      40              JSR   ESCOFF      ;REPLACE ORIGINAL CHARACTER
C921:29 7F         41              AND   #$7F        ;DROP HI BIT
C923:C9 60         42              CMP   #$60        ;IS IT LOWERCASE?
C925:90 02   C929  43              BCC   ESC1        ;=>NO, DON'T UPSHIFT
C927:29 DF         44              AND   #255-$20    ;UPSHIFT
C929:        C929  45 ESC1         EQU   *
C929:A0 11         46              LDY   #ESCNUM     ;COUNT/INDEX
C92B:        C92B  47 ESC2         EQU   *
C92B:D9 72 C9      48              CMP   ESCTAB,Y    ;IS IT A VALID ESCAPE?
C92E:F0 05   C935  49              BEQ   ESC3        ;=>YES
C930:88            50              DEY
C931:10 F8   C92B  51              BPL   ESC2        ;TRY 'EM ALL...
C933:30 10   C945  52              BMI   ESCSPEC     ;=>MAYBE IT'S A SPECIAL ONE
C935:              53 *
C935:        C935  54 ESC3         EQU   *
C935:B9 83 C9      55              LDA   ESCCHAR,Y   ;GET CHAR TO "PRINT"
C938:29 7F         56              AND   #$7F        ;DROP HI BIT (FLAG)
C93A:20 99 CB      57              JSR   CTLCHAR     ;EXECUTE IT
C93D:B9 83 C9      58              LDA   ESCCHAR,Y   ;GET FLAG
C940:30 D6   C918  59              BMI   ESCAPING    ;=>STAY IN ESCAPE MODE
C942:4C 05 C9      60              JMP   B.INPUT     ;=>QUIT ESCAPE MODE
C945:              61 *
C945:        C945  62 ESCSPEC      EQU   *
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C945:C9 11          63              CMP   #$11          ;IS IT ESC-CTLQ?
C947:D0 0B   C954   64              BNE   ESCSPEC2      ;=>NO
C949:20 AA CD       65              JSR   QUIT          ;DO THE QUITTING STUFF
C94C:A9 98          66              LDA   #$98          ;RETURN CTL-X AS
C94E:8D 7B 06       67              STA   CHAR          ; THE CHARACTER
C951:4C E2 C8       68              JMP   BIORET        ;=>QUIT THE CARD FOREVER
C954                69 *
C954:         C954  70 ESCSPEC2     EQU   *
C954:C9 52          71              CMP   #'R'          ;IS IT ESC-R?
C956:D0 0B   C963   72              BNE   ESCSPEC3      ;=>NO
C958:AD FB 04       73              LDA   MODE          ;YES, SET IT
C95B:09 80          74              ORA   #M.ESCR
C95D:8D FB 04       75              STA   MODE
C960:4C 05 C9       76 ESCNONE      JMP   B.INPUT       ;QUIT ESCAPE MODE
C963                77 *
C963.         C963  78 ESCSPEC3     EQU   *
C963:C9 54          79              CMP   #'T'          ;IS IT ESC-T?
C965:D0 F9   C960   80              BNE   ESCNDNE       ;=>NDTHING
C967:AD FB 04       81              LDA   MODE
C96A:29 7F          82              AND   #255-M.ESCR
C96C:8D FB 04       83              STA   MODE
C96F:4C 05 C9       84              JMP   B.INPUT       ;QUIT ESCAPE MODE
C972.         C972  86 ESCTAB       EQU   *
C972:40             87              ASC   '@'
C973:41             88              ASC   'A'           ;HANDLE OLD ESCAPES
C974:42             89              ASC   'B'
C975:43             90              ASC   'C'
C976:44             91              ASC   'D'
C977:45             92              ASC   'E'
C978:46             93              ASC   'F'
C979:49             94              ASC   'I'
C97A:4A             95              ASC   'J'
C97B:4B             96              ASC   'K'
C97C:4D             97              ASC   'M'
C97D:34             98              ASC   '4'
C97E:38             99              ASC   '8'
C97F.08            100              DFB   $08           ;LEFT ARROW
C980:0A            101              DFB   $0A           ;DOWN ARRDW
C981.0B            102              DFB   $0B           ;UP   ARRDW
C982:15            103              DFB   $15           ;RITE ARROW
C983:         0011 104 ESCNUM       EQU   *-ESCTAB
C983:              105              MSB   ON
C983:         C983 106 ESCCHAR      EQU   *
C983:0C            107              DFB   $0C+$00       ;@: FORMFEED
C984:1C            108              DFB   $1C           ;A: FS
C985:08            109              DFB   $08           ;B: BS
C986:0A            110              DFB   $0A           ;C. LF
C987:1F            111              DFB   $1F           ;D: US
C988:1D            112              DFB   $1D+$00       ;E: GS
C989:0B            113              DFB   $0B+$00       ;F: VT
C98A:9F            114              DFB   $1F+$80       ;I: US (STAY ESC)
C98B:88            115              DFB   $08+$80       ;J. BS (STAY ESC)
C98C:9C            116              DFB   $1C+$80       ;K: FS (STAY ESC)
C98D:8A            117              DFB   $0A+$80       ;M: LF (STAY ESC)
C98E:11            118              DFB   $11+$00       ;4 :DC1
C98F:12            119              DFB   $12+$00       ;8 :DC2
C990:88            120              DFB   $08+$80       ;<-:BS (STAY ESC)
C991:8A            121              DFB   $0A+$80       ;DN:LF (STAY ESC)
C992:9F            122              DFB   $1F+$80       ;UP:US (STAY ESC)
C993:9C            123              DFB   $1C+$80       ;->:FS (STAY ESC)
C994:              124 ----------------------------------------
C994:              126 ----------------------------------------
C994:              127 * PASCAL STATUS:
C994:              128 ----------------------------------------
C994:         C994 129 PSTATUS      EQU   *
C994:AA            130              TAX                 ;SAVE REQUEST CODE
C995:20 C8 CF      131              JSR   PSETUP        ;SETUP ZP STUFF
C998:8A            132              TXA                 ;IS IT 'READY FOR OUTPUT?'
C999:D0 03   C99E  133              BNE   PSTATUS2      ;=>NO
C99B:38            134              SEC                 ;YES, READY FOR OUTPUT
C99C:B0 16   C9B4  135              BCS   PSTATUS4
C99E:              136 *
C99E:         C99E 137 PSTATUS2     EQU   *
C99E:C9 01         138              CMP   #1            ;IS IT 'ANY INPUT?'
C9A0:F0 0E   C9B0  139              BEQ   PSTATUS3      ;=>YES
C9A2:A2 03         140              LDX   #3            ;IDRESULT='ILGL OPERATION'
C9A4:18            141              CLC
C9A5:60            142              RTS
C9A6:              143 ----------------------------------------
C9A6:              144 * PASCAL 1.0 OUTPUT HOOK:
C9A6:              145 ----------------------------------------
C9A6:00            146              BRK                 ;PADDING
C9A7:00            147              BRK
C9A8:00            148              BRK
C9A9:00            149              BRK
C9AA:         0000 150              IFNE  *-$C9AA
 S                 151              FAIL  2,'C9AA       HOOK ALIGNMENT'
C9AA:              152              FIN
C9AA:AD 78 06      153              LDA   CHAR          ;GET OUTPUT CHARACTER
C9AD:4C 57 C3      154              JMP   JPWRITE       ;=>USE STANDARD WRITE
C9B0:              155 *
```

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C9B0:                C9B0  156 PSTATUS3    EQU   *
C9B0: AD 00 C0             157               LDA   KBD          ;IS THERE A KEYPRESS?
C9B3: 0A                   158               ASL   A            ;STROBE-->CARRY
C9B4: A2 00                159 PSTATUS4      LDX   #0           ;IORESULT='GOOD'
C9B6: 60                   160               RTS
C9B7:                      162 ----------------------------------------
C9B7:                      163 *---- BASIC INPUT, CONTINUED.
C9B7                       164 *---- NOT AN ESCAPE SEQUENCE----
C9B7                       165 ----------------------------------------
C9B7                 C9B7  166 NOESC         EQU   *            ;NOT ESCAPE KEY
C9B7:                      167 *
C9B7 C9 95                 168               CMP   #$95         ;IS IT PICK?
C9B9: D0 08          C9C6  169               BNE   B.NOPICK     ;=>NOPE
C9BB: AC 7B 05             170               LDY   OURCH        ;YOU CAN PICK YER FRIENDS.
C9BE: 20 01 CF             171               JSR   PICK         ;YES, PICK THE CHAR
C9C1: 09 80                172               ORA   #$80         ;ALWAYS PICK AS NORMAL
C9C3: 8D 7B 06             173               STA   CHAR         ;SAVE AS KEYSTROKE
C9C6                       174 *
C9C6:                      175 * TRACK QUOTATION MARKS FOR THE
C9C6:                      176 *  RESTRICT-UPPERCASE FEATURE:
C9C6.                      177 *
C9C6:                C9C6  178 B.NOPICK      EQU   *
C9C6 AD FB 04              179               LDA   MODE         ;ARE WE DOING LITERAL INPUT?
C9C9 29 10                 180               AND   #M.LIT
C9CB: D0 12          C9DF  181               BNE   B.CHKCAN     ;=>YES
C9CD:                      182 *
C9CD:                      183 * LITERAL INPUT'S INACTIVE.  SEE IF
C9CD:                      184 *  WE CAN START LITERAL INPUT.
C9CD                       185 *
C9CD: AD 7B 06             186               LDA   CHAR         ;GET THE CHAR
C9D0: C9 A2                187               CMP   #$A2         ;IS IT A DOUBLE QUOTE?
C9D2: F0 23          C9F7  188               BEQ   B.FLIP       ;=>YES, FLIP LITERAL MODE
C9D4: C9 88                189               CMP   #$88         ;IS HE MOVING LEFT?
C9D6: D0 32          CA0A  190               BNE   B.FIXCHR     ;=>NOPE, JUST REG CHAR
C9D8: 20 27 CA             191               JSR   GETPRIOR     ;GRAB PRIOR CHAR
C9DB: D0 2D          CA0A  192               BNE   B.FIXCHR     ;=>NOT DELETING A QUOTE
C9DD: F0 18          C9F7  193               BEQ   B.FLIP       ;(ALWAYS) HE'S DELETED THE QUOTE
C9DF                       194 *
C9DF:                      195 * LITERAL INPUT'S ACTIVE.  SEE IF
C9DF:                      196 *  IT SHOULD BE CANCELLED YET:
C9DF:                      197 *
C9DF                 C9DF  198 B.CHKCAN      EQU   *
C9DF: AD 7B 06             199               LDA   CHAR         ;GET CURRENT CHAR
C9E2: C9 A2                200               CMP   #$A2         ;IS CURRENT CHAR THE CLOSING QUOTE?
C9E4: F0 1C          CA02  201               BEQ   B.CANLIT     ;=>YES
C9E6: C9 98                202               CMP   #$98         ;CANCEL LITERAL INPUT
C9E8: F0 18          CA02  203               BEQ   B.CANLIT     ;  IF CTLX OR RETURN
C9EA C9 8D                 204               CMP   #$8D         ;   OR BACK OVER "
C9EC F0 14           CA02  205               BEQ   B.CANLIT
C9EE: C9 88                206               CMP   #$88         ;BACKSPACE?
C9F0: D0 18          CA0A  207               BNE   B.FIXCHR     ;=>NO, NOT DELETING QUOTE
C9F2: 20 27 CA             208               JSR   GETPRIOR     ;GET CHAR HE'S DELETING
C9F5: D0 13          CA0A  209               BNE   B.FIXCHR     ;=>NOT DELETING A QUOTE
C9F7:                      210 *
C9F7:                C9F7  211 B.FLIP        EQU   *
C9F7: AD FB 04             212               LDA   MODE         ;FLIP THE MODE
C9FA: 49 10                213               EOR   #M.LIT
C9FC: 8D FB 04             214               STA   MODE
C9FF: 4C 0A CA             215               JMP   B.FIXCHR
CA02:                CA02  216 B.CANLIT      EQU   *
CA02: AD FB 04             217               LDA   MODE
CA05: 29 EF                218               AND   #255-M.LIT   ;CANCEL LITERAL INPUT
CA07: 8D FB 04             219               STA   MODE
CA0A:                      220 *
CA0A:                CA0A  221 B.FIXCHR      EQU   *
CA0A: AD FB 04             222               LDA   MODE         ;ESC-R FACILITY ACTIVE?
CA0D: 29 80                223               AND   #M.ESCR
CA0F: F0 13          CA24  224               BEQ   B.INRET      ;=>NOPE
CA11: AD FB 04             225               LDA   MODE         ;LITERAL INPUT ACTIVE?
CA14: 29 10                226               AND   #M.LIT
CA16: D0 0C          CA24  227               BNE   B.INRET      ;=>YES, NO UPSHIFT
CA18: AD 7B 06             228               LDA   CHAR         ;GET THE CHAR
CA1B: C9 E0                229               CMP   #$E0         ;IS CHAR LOWERCASE?
CA1D: 90 05          CA24  230               BCC   B.INRET      ;=>NO, NO NEED TO SHIFT IT
CA1F: 29 DF                231               AND   #$DF         ;RESTRICT TO U/C
CA21: 8D 7B 06             232               STA   CHAR
CA24:                      233 ----------------------------------------
CA24:                CA24  234 B.INRET       EQU   *
CA24: 4C E2 C8             235               JMP   BIORET       ;=>RETURN TO CALLER
CA27:                      237 ----------------------------------------
CA27:                      238 * NAME     : GETPRIOR
CA27:                      239 * FUNCTION: GET CHAR BEFORE CURSOR
CA27:                      240 * INPUT    : OURCH,OURCV
CA27:                      241 * OUTPUT   : 'BEQ' IF CHAR=DBL QUOTE
CA27:                      242 *          : 'BNE' IF NOT
CA27:                      243 * VOLATILE: AC,'TEMP1'
CA27:                      244 * CALLS    : PICK,X.BS,X.FS
CA27:                      245 ----------------------------------------
CA27:                      246 *
CA27:                CA27  247 GETPRIOR      EQU   *
CA27: AD FB 05             248               LDA   OURCV        ;DON'T TRY TO LOOK
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CA2A:OD 7B 05      249              ORA   OURCH        ; BACK IF @ UPPER-LEFT
CA2D:F0 1A   CA49  250              BEQ   GPX          ;  CORNER OF WINDOW!!!
CA2F:98            251              TYA                ;SAVE Y
CA30:48            252              PHA
CA31:20 DB CB      253              JSR   X.BS         ;BACK UP 1 CHAR
CA34:AC 7B 05      254              LDY   OURCH        ;GET CH AND
CA37:20 01 CF      255              JSR   PICK         ; PICK PRIOR CHAR
CA3A:09 80         256              ORA   #$80         ;PICK AS NORMAL VIDEO
CA3C:8D 7B 04      257              STA   TEMP1        ;HOLD CHAR
CA3F:20 26 CC      258              JSR   X.FS
CA42:68            259              PLA                ;RESTORE
CA43:A8            260              TAY                ; Y
CA44:AD 7B 04      261              LDA   TEMP1
CA47:C9 A2         262              CMP   #$A2         ;IS IT DBL QUOTE?
CA49:         CA49 263 GPX          EQU   *
CA49:60            264              RTS                ;RETURN WITH BEQ/BNE
CA4A:                 9             INCLUDE PINIT
CA4A                  2 ----------------------------------------
CA4A:                 3 * PASCAL INITIALIZATION.
CA4A:                 4 ----------------------------------------
CA4A:         CA4A    5 PINIT1.0    EQU   *
CA4A:A9 22            6              LDA   #M.PASCAL+M.PAS1.0
CA4C:4C 51 CA         7              JMP   PINIT2
CA4F:         CA4F    8 PINIT       EQU   *
CA4F:A9 20            9              LDA   #M.PASCAL    ;SAY WE'RE
CA51:                10 *
CA51:         CA51   11 PINIT2      EQU   *
CA51:8D F8 04        12              STA   MODE         ; RUNNING PASCAL
CA54:20 9B CD        13              JSR   FULL80       ;SET FULL 24x80 WINDOW
CA57:20 C8 CF        14              JSR   PSETUP       ;SETUP ZP STUFF
CA5A:                15 * BASE AOOR IS WRONG, BUT X FF FIXES IT BELOW
CA5A                 16 *  JSR BASCALC ;FORCE A GOOD BASCALC
CA5A                 17 *
CA5A                 18 * SEE IF THE CARD'S PLUGGED IN
CA5A                 19 *
CA5A 20 24 CB        20              JSR   TESTCARD     ;IS IT THERE?
CA5D:F0 03   CA62    21              BEQ   PIGOOD       ;=>YES
CA5F:A2 09           22              LDX   #9           ;IORESULT='NO DEVICE'
CA61:60              23              RTS
CA62                 24 *
CA62          CA62   25 PIGOOD      EQU   *
CA62 8D 01 C0        26              STA   SET80COL     ;ENABLE 80 STORE
CA65 8D 0D C0        27              STA   SET80VID     ;  AND 80 VIDEO
CA68 80 0F C0        28              STA   SETALTCHAR   ;NORM+INV LCASE
CA6B 20 42 CD        29              JSR   X.FF         ;HOME & CLEAR IT
CA6E.20 DD CE        30              JSR   INVERT       ;PUT CURSOR THERE
CA71.A2 00           31              LDX   #0           ;IORESULT='GOOD'
CA73:60              32              RTS
CA74                 10              INCLUDE PREAD
CA74                  2 ----------------------------------------
CA74:                 3 * PASCAL INPUT
CA74                  4 ----------------------------------------
CA74          CA74    5 PREAD       EQU   *
CA74 20 C8 CF         6              JSR   PSETUP       ;SETUP ZP STUFF
CA77:                 7 *
CA77:20 15 CB         8              JSR   GETKEY       ;GET A KEYSTROKE
CA7A 29 7F            9              AND   #$7F         ;DROP HI BIT
CA7C 8D 7B 06        10              STA   CHAR         ;SAVE THE CHAR
CA7F A2 00           11              LDX   #0           ;IORESULT='GOOD'
CA81 AD F8 04        12              LDA   MODE         ;ARE WE IN 1 0-MODE?
CA84:29 02           13              AND   #M.PAS1.0
CA86 F0 02   CA8A    14              BEQ   PREADRET2    ;=>NOPE
CA88.A2 C3           15              LDX   #:CN00       ;YES, RETURN CN IN X
CA8A:                16 *
CA8A          CA8A   17 PREADRET2   EQU   *
CA8A.AD 7B 06        18              LDA   CHAR         ;RESTORE CHAR
CA8D:60              19              RTS
CA8E                 11              INCLUDE PWRITE
CA8E                  2 ----------------------------------------
CA8E                  3 * PASCAL OUTPUT
CA8E                  4 ----------------------------------------
CA8E          CA8E    5 PWRITE      EQU   *
CA8E 8D 7B 06         6              STA   CHAR         ;SAVE CHARACTER
CA91 20 C8 CF         7              JSR   PSETUP       ;SETUP ZP STUFF
CA94                  8 *
CA94.20 DD CE         9              JSR   INVERT       ;TURN CURSOR OFF
CA97.AD F8 04        10              LDA   MODE         ;ARE WE DOING GOTOXY?
CA9A 29 08           11              AND   #M.GOXY
CA9C F0 2D   CACB    12              BEQ   PWRITE3      ;=>NO, PRINT IT
CA9E                 13 *
CA9E.                14 *  HANDLE GOTOXY STUFF:
CA9E                 15 *
CA9E          CA9E   16 PWRITE2     EQU   *
CA9E.AD F8 06        17              LDA   XCOORD       ;ARE WE WAITING FOR X?
CAA1 10 0C   CAAF    18              BPL   GETY          ;=>NO, THIS IS Y
CAA3.AD 7B 06        19              LDA   CHAR
CAA6 38              20              SEC
CAA7 E9 20           21              SBC   #32          ;MAKE BINARY
CAA9 8D F8 06        22              STA   XCOORD
CAAC 4C 0F CB        23              JMP   PWRITERET    ;=>NOW WAIT FOR Y
CAAF                 24 *
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CAAF:                    25 * NOW DO THE GOTOXY:
CAAF:                    26 *
CAAF:           CAAF     27 GETY         EQU   *
CAAF:AD 7B D6            28              LDA   CHAR          ;CONVERT YCOORD
CAB2.38                  29              SEC
CAB3:E9 20               30              SBC   #32
CAB5:8D FB 05            31              STA   OURCV
CAB8:20 51 CB            32              JSR   BASCALC       ;COMPUTE BASE ADDREBS
CABB.AD FB 06            33              LDA   XCOORD
CABE:8D 7B 05            34              STA   OURCH
CAC1:AD FB 04            35              LDA   MODE          ;TURN OFF GOTOXY
CAC4:29 F7               36              AND   #255-M.GOXY
CAC6:8D FB 04            37              STA   MODE
CAC9.D0 44     CBOF      38              BNE   PWRITERET    ;=>DONE (ALWAYS TAKEN)
CACB.                    39 *
CACB·           CACB     40 PWRITE3      EQU   *
CACB AD 7B 06            41              LDA   CHAR          ;GET CHAR TO PRINT
CACE.C9 1E               42              CMP   #$1E          ;IS IT GOTOXY?
CAD0 F0 0A     CADC      43              BEQ   STARTXY       ;=>YES
CAD2.C9 20               44              CMP   #$20          ;IS IT OTHER CTL?
CAD4:B0 15     CAEB      45              BCS   PWRITE4       ;=>NO, PRINT IT
CAD6:20 99 CB            46              JSR   CTLCHAR       ;EXECUTE IT IF POSSIBLE
CAD9 4C OF CB            47              JMP   PWRITERET     ;=>EXECUTED OR IGNORED
CADC                     48 *
CADC                     49 * START THE GOTOXY SEQUENCE.
CADC                     50 *
CADC            CADC     51 STARTXY      EQU   *
CADC AD FB 04            52              LDA   MODE          ;TURN ON FLAG
CADF 09 08               53              ORA   #M.GOXY
CAE1 8D FB 04            54              STA   MODE
CAE4 A9 FF               55              LDA   #-1           ;SET X NEGATIVE TO
CAE6 8D FB 06            56              STA   XCOORD        ; SHOW WE NEED IT
CAE9 30 24     CBOF      57              BMI   PWRITERET     ;=>EXIT TILL COORDS COME BY (ALWAYS)
CAEB                     58 *
CAEB                     59 * JUST A PRINTABLE CHARACTER
CAEB·                    60 *
CAEB            CAEB     61 PWRITE4      EQU   *
CAEB 09 80               62              ORA   #$80          ;FORCE TO NORMAL
CAED:AC 7B 05            63              LDY   OURCH         ;GET CH
CAF0.20 F2 CE            64              JSR   STORCHAR      ;STUFF IT
CAF3.                    65 *
CAF3·                    66 * BUMP CURSOR HORIZONTAL:
CAF3.                    67 *
CAF3:EE 7B 05            68              INC   OURCH         ;BUMP IT
CAF6.AD 7B 05            69              LDA   OURCH         ;ARE WE PAST THE
CAF9:C5 21               70              CMP   WNDWDTH       ; END OF THE LINE?
CAFB.90 12     CBOF      71              BCC   PWRITERET     ;=>NO, NO PROBLEM
CAFD·                    72 *
CAFD                     73 * IF IN TRANSPARENT MODE, DON'T
CAFD:                    74 *  WRAPAROUND THE RIGHT EDGE
CAFD:                    75 *
CAFD:AD FB 04            76              LDA   MODE          ;GET MODE
CB00:29 01               77              AND   #M.TRANS      ;WELL???
CB02.F0 05     CB09      78              BEQ   PWWRAP        ;=>NOT TRANSPARENT
CB04 CE 7B 05            79              DEC   OURCH         ;PIN AT RIGHT EDGE
CB07:D0 06     CBOF      80              BNE   PWRITERET     ;(ALWAYS TAKEN)
CB09·                    81 *
CB09.           CB09     82 PWWRAP       EQU   *
CB09:20 EC CB            83              JSR   X.CR          ;YES, DO C/R
CB0C 20 91 CC            84              JSR   X.LF          ; AND L/F
CBOF                     85 *
CBOF            CBOF     86 PWRITERET    EQU   *
CBOF 20 DD CE            87              JSR   INVERT        ;TURN CURSOR ON
CB12 A2 00               88              LDX   #0            ;IDRESULT='GOOD'
CB14.60                  89              RTS
CB15·                    12              INCLUDE SUBS1
CB15                      2 ------------------------------------------
CB15                      3 * NAME     . GETKEY
CB15.                     4 * FUNCTION· GET A KEYSTROKE
CB15·                     5 * INPUT    . NONE
CB15.                     6 * OUTPUT   · AC=KEYCODE
CB15:                     7 * VOLATILE· NONE
CB15                      8 ------------------------------------------
CB15.                     9 *
CB15            CB15     10 GETKEY       EQU   *
CB15 E6 4E               11              INC   RNDL          ;BUMP RANDOM SEED
CB17 D0 02     CB1B      12              BNE   GETK2
CB19 E6 4F               13              INC   RNDH
CB1B            CB1B     14 GETK2        EQU   *
CB1B·AD 00 C0            15              LDA   KBD           ;KEYPRESS?
CB1E.10 F5     CB15      16              BPL   GETKEY        ;=>NOPE
CB20·8D 10 C0            17              STA   KBDSTRB       ;CLEAR STROBE
CB23 60                  18              RTS
CB24                     19 ------------------------------------------
CB24                     20 * NAME     . TESTCARD
CB24                     21 * FUNCTION  SEE IF 80COL CARD PLUGGED IN
CB24                     22 * INPUT    . NONE
CB24                     23 * OUTPUT   · 'BEQ' IF CARD AVAILABLE
CB24                     24 *          . 'BNE' IF NOT
CB24                     25 * VOLATILE  AC,Y
CB24                     26 ------------------------------------------
CB24                     27 *
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CB24:          CB24   28 TESTCARD    EQU   *
CB24:AD 1C C0         29             LDA   RDPAGE2      ;REMEMBER CURRENT VIDEO DISPLAY
CB27:0A               30             ASL   A           ; IN THE CARRY
CB28:A9 BB            31             LDA   #$BB        ;USEFUL CHAR FOR TESTING
CB2A:2C 1B C0         32             BIT   RD80COL     ;REMEMBER VIDEO MODE IN 'N'
CB2D:8D 01 C0         33             STA   SET80COL    ;ENABLE 80COL STORE
CB30:08               34             PHP               ;LOCK INTERRUPTS WHILE
CB31:78               35             SEI               ; SCREENHOLES ARE WRONG
CB32:08               36             PHP               ;SAVE 'N' AND 'C' FLAGS
CB33:8D 55 C0         37             STA   TXTPAGE2    ;SET PAGE2
CB36:AC 00 04         38             LDY   $0400       ;GET FIRST CHAR
CB39:8D 00 04         39             STA   $0400       ;SET TO A '*'
CB3C:AD 00 04         40             LDA   $0400       ;GET IT BACK FROM RAM
CB3F:8C 00 04         41             STY   $0400       ;RESTORE ORIG CHAR
CB42:28               42             PLP               ;RESTORE 'N' AND 'C' FLAGS
CB43:B0 03     CB48   43             BCS   STAY2       ;STAY IN PAGE2
CB45:8D 54 C0         44             STA   TXTPAGE1    ;RESTORE PAGE1
CB48:          CB48   45 STAY2       EQU   *
CB48:30 03     CB4D   46             BMI   STAY80      ;=>STAY IN 80COL MODE
CB4A:8D 00 C0         47             STA   CLR80COL    ;TURN OFF 80COL STORE
CB4D:          CB4D   48 STAY80      EQU   *
CB4D:28               49             PLP               ;ALLOW IRQ AGAIN
CB4E:          CB4E   50 TESTFAIL    EQU   *
CB4E:C9 BB            51             CMP   #$BB        ;WAS CHAR VALID?
CB50:60               52             RTS               ;RETURN RESULT AS BEQ/BNE
CB51:                 53 ----------------------------------------
CB51:                 54 * NAME       BASCALC,BASCALCZ
CB51:                 55 * FUNCTION   CALC BASE ADDR FOR SCREEN LINE
CB51:                 56 * INPUT      OURCV (BASCALC)
CB51:                 57 *            AC=CV (BASCALCZ)
CB51:                 58 * OUTPUT     BASL/BASH
CB51:                 59 * VOLATILE   NOTHING
CB51:                 60 * CALLS      SNIFFIRQ
CB51:                 61 ----------------------------------------
CB51                  62 *
CB51:          FC75   63 SNIFFIRQ     EQU   $FC75
CB51                  64 *
CB51:          CB51   65 BASCALC      EQU   *           ;RIPPED OFF FROM F8 ROM
CB51.1B               66             CLC               ;SHOW ENTRY POINT
CB52:90 01     CB55   67             BCC   BSCLC1
CB54.          CB54   68 BASCALCZ     EQU   *
CB54:38               69             SEC               ;SHOW ENTRY POINT
CB55.          CB55   70 BSCLC1       EQU   *
CB55:48               71             PHA               ;SAVE AC
CB56:B0 03     CB5B   72             BCS   BSCLC1A     ;=>CV ALREADY IN AC
CB58:AD FB 05         73             LDA   OURCV
CB5B           CB5B   74 BSCLC1A      EQU   *
CB5B.48               75             PHA
CB5C:4A               76             LSR   A
CB5D:29 03            77             AND   #$03
CB5F:09 04            78             ORA   #$04
CB61 85 29            79             STA   BASH
CB63:8D FB 07         80             STA   OLDBASH     ;SAVE FOR F/W PROTOCOL
CB66:68               81             PLA
CB67.29 1B            82             AND   #$1B
CB69:90 02     CB6D   83             BCC   BSCLC2
CB6B:69 7F            84             ADC   #$7F
CB6D.85 28            85 BSCLC2      STA   BASL
CB6F:0A               86             ASL   A
CB70.0A               87             ASL   A
CB71:05 28            88             ORA   BASL
CB73 85 28            89             STA   BASL
CB75.                 90 *
CB75:                 91 * HANDLE THE SCROLLING WINDOW.
CB75:                 92 *
CB75:A5 20            93             LDA   WNDLFT
CB77:08               94             PHP               ;PRESERVE CARRY
CB78:2C 1F C0         95             BIT   RD80VID     ;WHICH MODE?
CB7B:10 01     CB7E   96             BPL   BASCLC3     ;=>40  NO DIVIDE
CB7D:4A               97             LSR   A           ;DIVIDE BY 2 FOR 80COL WINDOW
CB7E:          CB7E   98 BASCLC3      EQU   *
CB7E:28               99             PLP               ;RESTORE CARRY
CB7F.65 28           100             ADC   BASL        ;ADJUST BASE FOR WNDLFT
CB81:85 28           101             STA   BASL
CB83:8D 7B 07        102             STA   OLDBASL     ;SAVE FOR F/W PROTOCOL
CB86:                103 *
CB86:                104 * SNIFF FOR IRQ IF NECESSARY:
CB86:                105 *
CB86:AD FB 04        106             LDA   MODE
CB89:29 01           107             AND   #M.IRQ
CB8B:F0 0A     CB97  108             BEQ   BASCLCX     ;=>IRQ DISABLED, RETURN
CB8D:AD FB 04        109             LDA   MODE        ;IS BASIC RUNNING?
CB90:29 20           110             AND   #M.PASCAL
CB92:D0 03     CB97  111             BNE   BASCLCX     ;=>DON'T SNIFF UNDER PASCAL
CB94:20 75 FC        112             JSR   SNIFFIRQ    ;GO DO IT
CB97:          CB97  113 BASCLCX      EQU   *
CB97:68              114             PLA               ;RESTORE AC
CB98:60              115             RTS
CB99:                116 ----------------------------------------
CB99:                117 * NAME    : CTLCHAR
CB99:                118 * FUNCTION: EXECUTE CTL CHAR
CB99:                119 * INPUT   : AC=CHAR
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CB99:                  120 * OUTPUT    'BCS' IF NOT CTL
CB99:                  121 *           'BCC' IF CTL EXECUTED
CB99:                  122 * VOLATILE. NOTHING
CB99:                  123 * CALLS     MANY THINGS
CB99:                  124 *-------------------------------
CB99:                  125 *
CB99:          CB99    126 CTLCHAR     EQU   *
CB99:BD 7B 04          127             STA   TEMP1         ;TEMP SAVE OF CHAR
CB9C:48                128             PHA                 ;SAVE AC
CB9D:98                129             TYA                 ;SAVE Y
CB9E:48                130             PHA
CB9F:                  131 *
CB9F:AC 7B 04          132             LDY   TEMP1         ;GET CHAR IN QUESTION
CBA2:C0 07             133             CPY   #$07          ;IS IT NUL. ACK?
CBA4:90 05   CBAB      134             BCC   CTLCHARX      ;=>YES, NOT USED
CBA6:B9 71 CC          135             LDA   CTLADH-7,Y    ;IS IT CTL?
CBA9:D0 03   CBAE      136             BNE   CTLGO         ;=>YES
CBAB:          CBAB    137 CTLCHARX    EQU   *
CBAB:38                138             SEC                 ;SAY 'NOT CTL'
CBAC:B0 04   CBB2      139             BCS   CTLRET        ;=>DONE
CBAE:                  140 *
CBAE:          CBAE    141 CTLGO       EQU   *
CBAE:20 B6 CB          142             JSR   CTLXFER       ;EXECUTE SUBROUTINE
CBB1:                  143 *
CBB1:18                144             CLC                 ;SAY 'CTL CHAR EXECUTED'
CBB2:          CBB2    145 CTLRET      EQU   *
CBB2:68                146             PLA                 ;RESTORE
CBB3:A8                147             TAY                 ; Y
CBB4:68                148             PLA                 ;  AND AC
CBB5:60                149             RTS
CBB6:                  150 *
CBB6:          CBB6    151 CTLXFER     EQU   *
CBB6:48                152             PHA                 ;PUSH DNTO STACK FOR
CBB7:B9 58 CC          153             LDA   CTLADL-7,Y    ; TRANSFER TRICK
CBBA:48                154             PHA
CBBB:60                155             RTS                 ;XFER TO ROUTINE
CBBC:                  156 *
CBBC:                  157 * EXECUTE BELL.
CBBC:                  158 *
CBBC:          CBBC    159 X.BELL      EQU   *
CBBC:A9 40             160             LDA   #$40          ;RIPPED OFF FROM MONITOR
CBBE:20 CF CB          161             JSR   WAIT
CBC1:A0 C0             162             LDY   #$C0
CBC3:A9 0C             163 BELL2       LDA   #$0C
CBC5:20 CF CB          164             JSR   WAIT
CBC8:AD 30 C0          165             LDA   SPKR
CBCB:88                166             DEY
CBCC:D0 F5   CBC3      167             BNE   BELL2
CBCE:60                168             RTS
CBCF:                  169 *
CBCF:          CBCF    170 WAIT        EQU   *             ;RIPPED OFF FROM MONITOR ROM
CBCF:38                171             SEC
CBD0:48                172 WAIT2       PHA
CBD1:E9 01             173 WAIT3       SBC   #1
CBD3:D0 FC   CBD1      174             BNE   WAIT3
CBD5:68                175             PLA
CBD6:E9 01             176             SBC   #1
CBD8:D0 F6   CBD0      177             BNE   WAIT2
CBDA:60                178             RTS
CBDB:                  179 *
CBDB:                  180 * EXECUTE BACKSPACE.
CBDB:                  181 *
CBDB:          CBDB    182 X.BS        EQU   *
CBDB:CE 7B 05          183             DEC   OURCH         ;BACK UP CH
CBDE:10 0B   CBEB      184             BPL   BSDONE        ;=>DONE
CBE0:A5 21             185             LDA   WNDWDTH       ;BACK UP TO PRIOR LINE
CBE2:          CBE2    186 BS40        EQU   *
CBE2:8D 7B 05          187             STA   OURCH         ;SET CH
CBE5:CE 7B 05          188             DEC   OURCH
CBE8:20 34 CC          189             JSR   X.VS          ;NOW DO REV LINEFEED
CBEB:          CBEB    190 BSDONE      EQU   *
CBEB:60                191             RTS
CBEC:                  192 *
CBEC:                  193 * EXECUTE CARRIAGE RETURN:
CBEC:                  194 *
CBEC:          CBEC    195 X.CR        EQU   *
CBEC:AD FB D4          196             LDA   MODE          ;WHICH LANGUAGE?
CBEF:29 2D             197             AND   #M.PASCAL
CBF1:D0 0A   CBFD      198             BNE   X.CRPAS       ;=>PASCAL, NO CLR EOL
CBF3:AD FB 04          199             LDA   MODE          ;INPUT OR OUTPUT?
CBF6:29 4D             200             AND   #M.BINPUT
CBF8:F0 03   CBFD      201             BEQ   X.CRPAS       ;=>OUTPUT. NO CLEARING
CBFA:20 48 CD          202             JSR   X.GS          ;CLEAR TO EOL
CBFD:                  203 *
CBFD:          CBFD    204 X.CRPAS     EQU   *
CBFD:A9 00             205             LDA   #0            ;BACK UP CH TO
CBFF:8D 7B 05          206             STA   OURCH         ; BEGINNING OF LINE
CC02:AD FB D4          207             LDA   MODE          ;ARE WE IN BASIC?
CC05:29 20             208             AND   #M.PASCAL
CC07:D0 03   CC0C      209             BNE   X.CRRET       ;=>PASCAL, AVOID AUTO L/F
CC09:20 91 CC          210             JSR   X.LF          ;EXECUTE AUTO LF FOR BASIC
CC0C:          CC0C    211 X.CRRET     EQU   *
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CC0C:60                 212                     RTS
CC0D:           0000    213                     DO      0               ;NO MORE ROM SPACE!
 S                      214 *
 S                      215 *                   EXECUTE SYNC:
 S                      216 *
 S                      217 X.SYN               EQU     *
 S                      218                     LDA     RDVBLBAR        ;WAIT FOR VBL
 S                      219                     BPL     X.SYN           ;=>WAIT FOR VIDEO SCAN
 S                      220 X.SYN2              LDA     RDVBLBAR        ;NOW WAIT FOR
 S                      221                     BMI     X.SYN2          ; BLANKING TO BEGIN
 S                      222                     RTS
CC0D:                   223                     FIN
CC0D:                   224 *
CC0D.                   225 * EXECUTE HOME:
CC0D.                   226 *
CC0D:           CC0D    227 X.EM                EQU     *
CC0D:A5 22              228                     LDA     WNDTOP
CC0F:8D FB 05           229                     STA     OURCV           ;STUFF CV
CC12:A9 00              230                     LDA     #0
CC14:8D 7B 05           231                     STA     OURCH           ;STUFF CH
CC17:4C 51 CB           232                     JMP     BASCALC         ;RETURN VIA BASCALC (UGH!)
CC1A:                   233 *
CC1A.                   234 * EXECUTE CLEAR LINE.
CC1A:                   235 *
CC1A.           CC1A    236 X.SUB               EQU     *
CC1A:A4 21              237                     LDY     WNDWDTH
CC1C:88                 238                     DEY
CC1D            CC1D    239 X.SUB80             EQU     *
CC1D.A9 A0              240                     LDA     #' '            ;BLANKIE BLANK
CC1F:           CC1F    241 X.SUBLP             EQU     *
CC1F:20 F2 CE           242                     JSR     STORCHAR        ;STUFF THE BLANK
CC22:88                 243                     DEY
CC23.10 FA      CC1F    244                     BPL     X.SUBLP         ;=>CLEAR THE LINE
CC25:60                 245                     RTS
CC26:                   246 *
CC26.                   247 * EXECUTE FORWARD SPACE
CC26:                   248 *
CC26:           CC26    249 X.FS                EQU     *
CC26:EE 7B 05           250                     INC     OURCH           ;BUMP CH
CC29:AD 7B 05           251                     LDA     OURCH           ;GET THE POSITION
CC2C.C5 21              252                     CMP     WNDWDTH         ;OFF THE RIGHT SIDE?
CC2E:90 03      CC33    253                     BCC     X.FSRET         ;=>NO, GOOD
CC30:20 EC CB           254                     JSR     X.CR            ;=>YES, WRAP AROUND
CC33:                   255 *
CC33.           CC33    256 X.FSRET             EQU     *
CC33.60                 257                     RTS
CC34:                   258 *
CC34.                   259 * EXECUTE REVERSE LINEFEED.
CC34:                   260 *
CC34.           CC34    261 X.US                EQU     *
CC34.CE FB 05           262                     DEC     OURCV           ;BACK UP CV
CC37.30 07      CC40    263                     BMI     X.US1           ;=>OFF TOP OF SCREEN
CC39.AD FB 05           264                     LDA     OURCV
CC3C.C5 22              265                     CMP     WNDTOP          ;OFF TOP OF WINDOW?
CC3E.B0 05      CC45    266                     BCS     X.US2           ;=>NO, STILL IN WINDOW
CC40:                   267 *
CC40:                   268 * PIN CV TO WINDOW TOP
CC40.                   269 *
CC40:           CC40    270 X.US1               EQU     *
CC40:EE FB 05           271                     INC     OURCV           ;PUT BACK WHERE IT WAS
CC43:F0 03      CC48    272                     BEQ     X.USRET         ;IT GOES TO 0 ALWAYS
CC45:           CC45    273 X.US2               EQU     *
CC45.20 51 CB           274                     JSR     BASCALC         ;RECOMPUTE BASE ADDR
CC48            CC48    275 X.USRET             EQU     *
CC48.60                 276                     RTS
CC49:                   277 *
CC49.                   278 * EXECUTE "NORMAL VIDEO"
CC49:                   279 *
CC49.           CC49    280 X.SO                EQU     *
CC49:AD FB 04           281                     LDA     MODE            ;SET MODE BIT
CC4C.29 FB              282                     AND     #255-M.VMODE    ;SET 'NORMAL'
CC4E.A0 FF              283                     LDY     #255
CC50:D0 07      CC59    284                     BNE     STUFFINV        ;(ALWAYS)
CC52.                   285 *
CC52:                   286 * EXECUTE "INVERSE VIDEO"
CC52.                   287 *
CC52:           CC52    288 X.SI                EQU     *
CC52.AD FB 04           289                     LDA     MODE            ;SET MODE BIT
CC55:09 04              290                     ORA     #M.VMODE        ;SET 'INVERSE'
CC57.A0 7F              291                     LDY     #127
CC59            CC59    292 STUFFINV            EQU     *
CC59.8D FB 04           293                     STA     MODE            ;SET MODE
CC5C.84 32              294                     STY     INVFLG          ;STUFF FLAG TOO
CC5E.60                 295                     RTS
CC5F            CC5F    297 CTLADL              EQU     *
CC5F:BB                 298                     DFB     >X.BELL-1       ;BEL
CC60.DA                 299                     DFB     >X.BS-1         ;BS
CC61.00                 300                     DFB     0               ;HT
CC62.90                 301                     DFB     >X.LF-1         ;LF
CC63.22                 302                     DFB     >X.VT-1         ;VT
CC64.41                 303                     DFB     >X.FF-1         ;FF
CC65.EB                 304                     DFB     >X.CR-1         ;CR
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CC66:48              305              DFB   >X.SO-1      ;SO
CC67:51              306              DFB   >X.SI-1      ;SI
CC68:DD              307              DFB   0            ;DLE
CC69:5B              308              DFB   >X.DC1-1     ;DC1
CC6A:76              309              DFB   >X.DC2-1     ;DC2
CC6B:0D              310              DFB   0            ;DC3
CC6C:0D              311              DFB   0            ;DC4
CC6D:BF              312              DFB   >X.NAK-1     ;NAK
CC6E:A9              313              DFB   >SCROLLDN-1  ;SYN
CC6F:A3              314              DFB   >SCROLLUP-1  ;ETB
CC70:00              315              DFB   0            ;CAN
CC71:0C              316              DFB   >X.EM-1      ;EM
CC72:19              317              DFB   >X.SUB-1     ;SUB
CC73:D0              318              DFB   0            ;ESC
CC74:25              319              DFB   >X.FS-1      ;FS
CC75:47              320              DFB   >X.GS-1      ;GS
CC76:D0              321              DFB   0            ;RS
CC77:33              322              DFB   >X.US-1      ;US
CC78                 323 *
CC7B:          CC78  324 CTLADH       EQU   *
CC78:CB              325              DFB   <X.BELL-1    ;BEL
CC79:CB              326              DFB   <X.BS-1      ;BS
CC7A:D0              327              DFB   0            ;HT
CC7B:CC              328              DFB   <X.LF-1      ;LF
CC7C:CD              329              DFB   <X.VT-1      ;VT
CC7D:CD              330              DFB   <X.FF-1      ;FF
CC7E:CB              331              DFB   <X.CR-1      ;CR
CC7F:CC              332              DFB   <X.SO-1      ;SO
CC80:CC              333              DFB   <X.SI-1      ;SI
CC81:00              334              DFB   0            ;DLE
CC82:CD              335              DFB   <X.DC1-1     ;DC1
CC83:CD              336              DFB   <X.DC2-1     ;DC2
CC84:00              337              DFB   0            ;DC3
CC85:00              338              DFB   0            ;DC4
CC86:CD              339              DFB   <X.NAK-1     ;NAK
CC87:CC              340              DFB   <SCROLLDN-1  ;SYN
CC88:CC              341              DFB   <SCROLLUP-1  ;ETB
CC89:00              342              DFB   0            ;CAN
CC8A:CC              343              DFB   <X.EM-1      ;EM
CC8B:CC              344              DFB   <X.SUB-1     ;SUB
CC8C:00              345              DFB   0            ;ESC
CC8D:CC              346              DFB   <X.FS-1      ;FS
CC8E:CD              347              DFB   <X.GS-1      ;GS
CC8F:00              348              DFB   0            ;RS
CC90:CC              349              DFB   <X.US-1      ;US
CC91:                 13              INCLUDE SUBS2
CC91.                  2 *
CC91.                  3 * EXECUTE LINEFEED
CC91                   4 *
CC91.          CC91    5 X.LF         EQU   *
CC91:EE FB 05          6              INC   OURCV        ;BUMP CV
CC94:AD FB 05          7              LDA   OURCV        ;SEE IF OFF BOTTOM
CC97:C5 23             8              CMP   WNDBTM       ;OFF THE END?
CC99:B0 03   CC9E      9              BCS   X.LF2        ;=>YES
CC9B:4C 20 CD         10              JMP   X.LFRET      ;=>NO, DONE
CC9E.          CC9E   11 X.LF2        EQU   *
CC9E.A4 23            12              LDY   WNDBTM       ;SET TO
CCA0.88               13              DEY
CCA1:8C FB 05         14              STY   OURCV        ; THE BOTTOM
CCA4                  15 *
CCA4.                 16 * SCROLL THE SCREEN
CCA4                  17 *
CCA4           CCA4   18 SCROLLUP     EQU   *
CCA4:8A               19              TXA                ;SAVE X
CCA5.48               20              PHA
CCA6:A2 01            21              LDX   #1           ;DIRECTION=UP
CCA8:D0 04   CCAE     22              BNE   SCROLL1
CCAA           CCAA   23 SCROLLDN     EQU   *
CCAA:8A               24              TXA                ;SAVE X
CCAB.48               25              PHA
CCAC:A2 00            26              LDX   #0           ;DIRECTION=DOWN
CCAE                  27 *
CCAE           CCAE   28 SCROLL1      EQU   *
CCAE 2C 1F C0         29              BIT   RDBOVID      ;WHICH MODE?
CCB1.10 05   CCB8     30              BPL   SCROLL2      ;=>40  DO WITH EXISTING WIDTH
CCB3:A5 21            31              LDA   WNDWDTH      ;TEMPORARILY SAVE
CCB5:48               32              PHA                ; THE WIDTH AND
CCB6:46 21            33              LSR   WNDWDTH      ;  DIVIDE IT BY 2
CCB8                  34 *
CCB8           CCB8   35 SCROLL2      EQU   *
CCB8 20 D1 CC         36              JSR   SCRLSUB      ;SCROLL 40 COLS
CCBB 2C 1F C0         37              BIT   RDBOVID      ;ARE WE IN 80-MODE?
CCBE 10 51   CD11     38              BPL   X.SCRLRET    ;=>NO, DONE
CCC0                  39 *
CCC0                  40 * FOR 80, DO THE OTHER PAGE .
CCC0                  41 *
CCC0.08               42              PHP                ;ENSURE IRQ INHIBITED
CCC1:78               43              SEI                ; WHILE TXTPAGE2 MAPPED IN
CCC2 AD 55 C0         44              LDA   TXTPAGE2     ;SET PAGE2
CCC5 20 D1 CC         45              JSR   SCRLSUB      ;SCROLL PAGE 2
CCC8 AD 54 C0         46              LDA   TXTPAGE1     ;RESTORE PAGE1
CCCB:28               47              PLP                ;RESTORE IRQ STATE NOW
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CCCC: 68              48              PLA
CCCD: 85 21           49              STA   WNDWDTH
CCCF: DD 40   CD11    50              BNE   X.SCRLRET   ;=>DONE SCROLL80 (ALWAYS TAKEN)
CCD1.                 51 *
CCD1                  52 * 40-COLUMN WINDOWED SCROLL:
CCD1:                 53 *
CCD1.         CCD1    54 SCRLSUB    EQU   *
CCD1: BC F9 CF        55            LDY   WNDTAB,X    ;GET WINDOW TOP/BOT
CCD4: B9 00 00        56            LDA   0,Y
CCD7: E0 01           57            CPX   #1          ;SCROLLING UP?
CCD9: BD 02   CCDD    58            BCS   MSCRL0      ;=>YES, NO PROBLEM
CCDB: E9 00           59            SBC   #0          ;-1 IF DOWN (SRC=BTM-1)
CCDD:         CCDD    60 MSCRL0     EQU   *
CCDD: 48              61            PHA
CCDE: 20 54 C8        62            JSR   BASCALCZ
CCE1: A5 2B           63 MSCRL1     LDA   BASL
CCE3: 85 2A           64            STA   BAS2L
CCE5: A5 29           65            LDA   BASH
CCE7: 85 2B           66            STA   BAS2H
CCE9: A4 21           67            LDY   WNDWDTH
CCEB: 88              68            DEY
CCEC: 68              69            PLA
CCED: 18              70            CLC
CCEE: 7D F0 CF        71            ADC   PLUSMINUS1,X ;UP/DOWN
CCF1: D5 22           72            CMP   WNDTOP,X    ;AT THE END?
CCF3: F0 0D   CDD2    73            BEQ   MSCRLRET
CCF5: 48              74            PHA
CCF6: 20 54 C8        75            JSR   BASCALCZ
CCF9: B1 28           76 MSCRL2     LDA   (BASL),Y
CCFB: 91 2A           77            STA   (BAS2L),Y
CCFD: 88              78            DEY
CCFE: 10 F9   CCF9    79            BPL   MSCRL2
CDD0: 30 DF   CCE1    80            BMI   MSCRL1
CDD2:                 81 *
CDD2:         CDD2    82 MSCRLRET   EQU   *
CDD2: E0 D0           83            CPX   #0          ;SCROLLING DOWN?
CDD4: D0 0A   CD10    84            BNE   MSCRLRTS    ;=>NO
CDD6: 20 54 C8        85            JSR   BASCALCZ
CDD9.         CDD9    86 ONEMORE    EQU   *
CDD9: B1 28           87            LDA   (BASL),Y
CDDB: 91 2A           88            STA   (BAS2L),Y
CDDD: 88              89            DEY
CDDE 10 F9    CDD9    90            BPL   ONEMORE
CD1D.         CD10    91 MSCRLRTS   EQU   *
CD10: 60              92            RTS
CD11:                 93 *
CD11:                 94 * DONE WITH THE SCRDLLING JAZZ:
CD11:                 95 *
CD11.         CD11    96 X.SCRLRET  EQU   *
CD11: B4 22           97            LDY   WNDTOP,X    ;CLEAR TOP OR BOTTOM LINE
CD13: 8A              98            TXA               ;IF GETTING TDP,
CD14: F0 01   CD17    99            BEQ   X.SCRLRET2  ; DON'T DECREMENT!
CD16: 88             100            DEY
CD17:         CD17   101 X.SCRLRET2 EQU   *
CD17. 98             102            TYA               ;TEMP CV SETUP
CD18: 20 54 C8       103            JSR   BASCALCZ    ;COMPUTE BASE OF LINE TO CLEAR
CD1B: 68             104            PLA               ;RESTORE
CD1C: AA             105            TAX               ; X
CD1D: 20 1A CC       106            JSR   X.SUB       ;CLEAR BOTTOM LINE
CD2D:                107 *
CD2D:         CD20   108 X.LFRET    EQU   *
CD20: 4C 51 C8       109            JMP   BASCALC     ;RETURN VIA BASCALC (UGH!)
CD23:                110 *
CD23.                111 * EXECUTE CLR TO EOS:
CD23:                112 *
CD23:         CD23   113 X.VT       EQU   *
CD23: 20 48 CD       114            JSR   X.GS        ;CLEAR TO EOL
CD26: AD FB 05       115            LDA   OURCV       ;SAVE CV
CD29: 48             116            PHA
CD2A: 1D D6   CD32   117            BPL   X.VTNEXT    ;DO NEXT LINE (ALWAYS TAKEN)
CD2C:         CD2C   118 X.VTLDOP   EQU   *
CD2C: 20 51 C8       119            JSR   BASCALC     ;BASCALC IT
CD2F: 2D 1A CC       120            JSR   X.SUB       ;CLEAR LINE
CD32:         CD32   121 X.VTNEXT   EQU   *
CD32: EE FB 05       122            INC   OURCV       ;BUMP CV
CD35: AD FB 05       123            LDA   OURCV
CD38: C5 23          124            CMP   WNDBTM      ;OFF SCREEN?
CD3A: 90 F0   CD2C   125            BCC   X.VTLDOP    ;=>NO, KEEP GOING
CD3C: 68             126            PLA               ;RESTORE
CD3D: 8D FB 05       127            STA   OURCV       ; CV
CD4D: 1D DE   CD20   128            BPL   X.LFRET     ;RETURN VIA SIMILAR CODE
CD42:                129 *
CD42:                130 * EXECUTE CLEAR:
CD42:                131 *
CD42.         CD42   132 X.FF       EQU   *
CD42: 20 0D CC       133            JSR   X.EM        ;HOME THE CURSOR
CD45: 4C 23 CD       134            JMP   X.VT        ;RETURN VIA CLREOS (UGH!)
CD48:                135 *
CD48:                136 * EXECUTE CLEAR TO EOL:
CD48:                137 *
CD48:         CD48   138 X.GS       EQU   *
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CD4B AC 7B 05       139               LDY   OURCH       ;GET CH
CD4B 4C 54 CD       140               JMP   X.GS2       ;CHECK FOR END FIRST'
CD4E          CD4E  141 X.GSEDLZ      EQU   *           ;FER U HACKERS
CD4E A9 A0          142               LDA   #' '
CD50 20 F2 CE       143               JSR   STORCHAR    ;STUFF IT
CD53 C8             144               INY
CD54          CD54  145 X.GS2         EQU   *
CD54 C4 21          146               CPY   WNDWDTH     ;STOP SOMETIME
CD56 90 F6    CD4E  147               BCC   X.GSEDLZ    ;YASL DO MORE
CD58 60             148               RTS
CD59                149 *
CD59                150 * EXECUTE '40COL MODE':
CD59                151 *
CD59          CD59  152 X.DC1         EQU   *
CD59 A9 00          153               LDA   #0          ;ASSUME TEXTMODE
CD5B B5 20          154               STA   WNDLFT
CD5D 2C 1A C0       155               BIT   RDTEXT      ;ARE WE IN TEXT MODE?
CD60 30 02    CD64  156               BMI   X.DC1B      ;=>YES
CD62 A9 14          157               LDA   #20         ;IF GR, SET SPLITSCREEN
CD64          CD64  158 X.DC1B        EQU   *
CD64 85 22          159               STA   WNDTOP
CD66 A9 18          160               LDA   #24
CD68 85 23          161               STA   WNDBTM
CD6A A9 28          162               LDA   #40
CD6C 85 21          163               STA   WNDWDTH
CD6E 2C 1F C0       164               BIT   RD80VID     ;WERE WE IN 80-MODE?
CD71 10 03    CD76  165               BPL   X.DC1RTS    ;=>NO, NO CVT NEEDED
CD73 20 DB CD       166               JSR   SCRN84      ;CVT 80-->40
CD76          CD76  167 X.DC1RTS      EQU   *
CD76 60             168               RTS
CD77                169 *
CD77                170 * EXECUTE '80COL MODE':
CD77                171 *
CD77          CD77  172 X.DC2         EQU   *
CD77 20 24 CB       173               JSR   TESTCARD    ;IS CARD THERE?
CD7A D0 1E    CD9A  174               BNE   X.DC2RET    ;=>NOPE, FORGET IT
CD7C 20 9B CD       175               JSR   FULL80      ;SET FULL WINDOW
CD7F 2C 1A C0       176               BIT   RDTEXT      ;ARE WE IN TEXT MODE?
CD82 30 04    CD88  177               BMI   X.DC2B      ;=>YES
CD84 A9 14          178               LDA   #20         ;IF GR, SET SPLITSCREEN
CD86 85 22          179               STA   WNDTOP
CD88          CD8B  180 X.DC2B        EQU   *
CD88 2C 1B C0       181               BIT   RD80COL     ;REMEMBER PRIOR MODE
CD8B 30 0D    CD9A  182               BMI   X.DC2RET    ;=>NO CVT NEEDED IF WAS 80
CD8D 4C 32 CE       183               JMP   SCRN48      ;RET VIA CONVERT 40-->80
CD90                184 *
CD90                185 * EXECUTE 'QUIT':
CD90                186 *
CD90          CD90  187 X.NAK         EQU   *
CD90 AD FB 04       188               LDA   MODE        ;ONLY VALID IN BASIC
CD93 29 20          189               AND   #M.PASCAL
CD95 D0 03    CD9A  190               BNE   X.NAKRET    ;IGNORE IF PASCAL
CD97 20 AA CD       191               JSR   QUIT        ;GET SETUP TO QUIT
CD9A          CD9A  192 X.NAKRET      EQU   *
CD9A          CD9A  193 X.DC2RET      EQU   *
CD9A 60             194               RTS               ;DONE, CALLER WON'T RETURN
CD9B                195 ----------------------------------------
CD9B                196 * NAME     : FULL80
CD9B                197 * FUNCTION: SET FULL 80COL WINDOW
CD9B                198 * INPUT    : NONE
CD9B                199 * OUTPUT   : WINDOW PARAMETERS
CD9B                200 * VOLATILE: AC
CD9B                201 ----------------------------------------
CD9B                202 *
CD9B          CD9B  203 FULL80        EQU   *
CD9B A9 00          204               LDA   #0
CD9D 85 22          205               STA   WNDTOP
CD9F 85 20          206               STA   WNDLFT
CDA1 A9 50          207               LDA   #80
CDA3 85 21          208               STA   WNDWDTH
CDA5 A9 18          209               LDA   #24
CDA7 85 23          210               STA   WNDBTM
CDA9 60             211               RTS
CDAA                212 ----------------------------------------
CDAA                213 * NAME     : QUIT
CDAA                214 * FUNCTION: SETUP TO QUIT THE CARD
CDAA                215 * INPUT    : NOTHING
CDAA                216 * OUTPUT   : NOTHING
CDAA                217 * VOLATILE: ALL REGS
CDAA                218 * CALLS    : X.FF,FULL80,BASCALC
CDAA                219 *          : SETKBD,SETVID
CDAA                220 ----------------------------------------
CDAA                221 *
CDAA          CDAA  222 QUIT          EQU   *
CDAA A9 00          223               LDA   #0          ;SET FULL 40-COL WINDOW
CDAC 85 22          224               STA   WNDTOP
CDAE 85 20          225               STA   WNDLFT
CDB0 A9 18          226               LDA   #24
CDB2 85 23          227               STA   WNDBTM
CDB4 A9 28          228               LDA   #40
CDB6 85 21          229               STA   WNDWDTH
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CDB8:2C 1F C0      230              BIT   RD80VID      ;WHAT WIDTH?
CDBB:10 03   CDC0  231              BPL   QUIT2        ;=>NO CVT NEEDED IF 40
CDBD:20 DB CD      232              JSR   SCRN84       ;CONVERT 40-->80
CDC0:              233 *
CDC0:         CDC0 234 QUIT2        EQU   *
CDC0:A9 17         235              LDA   #23          ;VTAB TO THE
CDC2:8D FB 05      236              STA   OURCV        ; BOTTOM LINE
CDC5:20 51 C8      237              JSR   BASCALC
CDC8:A9 00         238              LDA   #0           ;  AND PLACE CURSOR
CDCA:8D 7B 05      239              STA   OURCH        ;    AT LEFT SIDE
CDCD:8D 0E C0      240              STA   CLRALTCHAR   ;LCASE CHARS OFF
CDD0:A9 FF         241              LDA   #$FF         ;DESTROY THE
CDD2:8D FB D4      242              STA   MODE         ; MODE BYTE
CDD5:20 93 FE      243              JSR   SETVID       ;PR#0
CDD8:4C 89 FE      244              JMP   SETKBD       ;RETURN VIA IN#0 (UGH!)
CDDB:              245 ---------------------------------------
CDDB:              246 * NAME     : SCRN84
CDDB:              247 * FUNCTION: CONVERT BDVID-->40VID
CDDB:              248 * INPUT    : NONE
CDDB:              249 * OUTPUT   : NONE
CDDB:              250 * VOLATILE: ALL REGISTERS
CDDB:              251 * NOTE     : USES 'BAS2H/L' AS TEMPS
CDDB:              252 ---------------------------------------
CDDB:              253 *
CDDB:         CDDB 254 SCRN84       EQU   *
CDDB:AD FB D5      255              LDA   OURCV        ;SAVE CURRENT
CDDE:48            256              PHA
CDDF:AD 7B D5      257              LDA   OURCH        ; SETTINGS
CDE2:48            258              PHA
CDE3:              259 *
CDE3:A9 17         260              LDA   #23
CDE5:85 2A         261              STA   BAS2L        ;USE AS A TEMP
CDE7:8D 01 C0      262              STA   SET80COL
CDEA:A5 2A         263 SCR40         LDA   BAS2L
CDEC:20 54 CB      264              JSR   BASCALCZ     ;BEGIN AT BOTTOM AND WORK UP
CDEF:20 0A CE      265              JSR   ATEFOR       ;DO THIS LINE
CDF2:C6 2A         266              DEC   BAS2L
CDF4:30 0B   CE01  267              BMI   SCR40RET     ;=>DONE (HIT TOP)
CDF6:2C 1A C0      268              BIT   RDTEXT       ;ARE WE IN MIDEKMODE?
CDF9:30 EF   CDEA  269              BMI   SCR40        ;=>NO, DO ENTIRE SCREEN
CDFB:A5 2A         270              LDA   BAS2L        ;IF SO, ONLY DO BOTTOM
CDFD:C9 14         271              CMP   #20          ; FOUR (4) LINES OF WINDOW
CDFF:B0 E9   CDEA  272              BCS   SCR40
CE01:         CE01 273 SCR40RET     EQU   *
CE01:8D 00 C0      274              STA   CLR80COL
CE04:8D 0C CD      275              STA   CLR80VID
CE07:4C 58 CE      276              JMP   SCRNRET      ;RETURN VIA SIMILAR CODE
CE0A:              277 *
CE0A:         CE0A 278 ATEFOR       EQU   *
CE0A:08            279              PHP                ;LOCK IRQ WHILE
CE0B:78            280              SEI                ; SCREENHOLES ARE WRONG
CE0C:A0 28         281              LDY   #40
CE0E:84 2B         282              STY   BAS2H
CE10:2C 54 CD      283              BIT   TXTPAGE1
CE13:20 22 CE      284 ATEFOR1       JSR   GET84
CE16:2C 55 C0      285              BIT   TXTPAGE2
CE19:20 22 CE      286              JSR   GET84
CE1C:A4 2B         287              LDY   BAS2H        ;DONE?
CE1E:D0 F3   CE13  288              BNE   ATEFOR1      ;=>NO, DO WHOLE LINE
CE20:28            289              PLP                ;RESTORE IRQ NOW
CE21:60            290              RTS
CE22:              291 *
CE22:C6 2B         292 GET84         DEC   BAS2H
CE24:A5 2B         293              LDA   BAS2H
CE26:4A            294              LSR   A
CE27:A8            295              TAY
CE28:B1 28         296              LDA   (BASL),Y
CE2A:A4 2B         297              LDY   BAS2H
CE2C:2C 54 C0      298              BIT   TXTPAGE1
CE2F:91 28         299              STA   (BASL),Y
CE31:60            300              RTS
CE32:              301 ---------------------------------------
CE32:              302 * NAME     : SCRN48
CE32:              303 * FUNCTION : CONVERT 40VID-->80VID
CE32:              304 * INPUT    : NONE
CE32:              305 * OUTPUT   : NONE
CE32:              306 * VOLATILE: ALL REGISTERS
CE32:              307 * NOTE     : USES 'BAS2H/L' AS TEMPS
CE32:              308 ---------------------------------------
CE32:              309 *
CE32:         CE32 310 SCRN48       EQU   *
CE32:AD FB 05      311              LDA   OURCV        ;SAVE CV
CE35:48            312              PHA
CE36:AD 7B 05      313              LDA   OURCH        ; AND CH
CE39:48            314              PHA
CE3A:              315 *
CE3A:A9 17         316              LDA   #23
CE3C:85 2A         317              STA   BAS2L        ;USE AS A TEMP
CE3E:A5 2A         318 SCR80         LDA   BAS2L
CE40:20 54 CB      319              JSR   BASCALCZ     ;BEGIN AT BOTTOM AND WORK UP
CE43:20 63 CE      320              JSR   FORATE       ;DO THIS LINE
CE46:C6 2A         321              DEC   BAS2L
```

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CE48:30 0B    CE55  322             BMI   SCR80RET    ;=>DONE (HIT TOP)
CE4A:2C 1A C0       323             BIT   RDTEXT      ;ARE WE IN MIXEDMODE?
CE4D:30 EF    CE3E  324             BMI   SCR80       ;NO, DO FULL SCREEN
CE4F:A5 2A          325             LDA   BAS2L       ;IF 80, ONLY DO BOTTOM
CE51:C9 14          326             CMP   #20         ; FOUR (4) LINES OF WINDOW
CE53:B0 E9    CE3E  327             BCS   SCR80
CE55:               328 *
CE55:         CE55  329 SCR80RET    EQU   *
CE55:8D 0D C0       330             BTA   SET80VID    ;DISPLAY IN 80-MODE
CE58:         CE58  331 SCRNRET     EQU   *           ;USED BY SCRN84
CE58:68             332             PLA               ;RESTORE
CE59:8D 7B 05       333             STA   OURCH       ; CH AND
CE5C:68             334             PLA               ;  CV
CE5D:8D FB 05       335             STA   OURCV
CE60:4C 51 C8       336             JMP   BASCALC     ;RETURN VIA BASCALC (UGH!)
CE63:               337 *
CE63:               338 *
CE63:         CE63  339 FORATE      EQU   *
CE63:08             340             PHP               ;DON'T ALLOW IRQ WHILE
CE64:78             341             SEI               ; SCREENHOLES ARE WRONG
CE65:A0 00          342             LDY   #0
CE67:84 28          343             STY   BAS2H
CE69:8C 01 C0       344             STY   SET80COL
CE6C:2C 54 C0       345             BIT   TXTPAGE1
CE6F:B1 28          346 FORATE1     LDA   (BASL),Y
CE71:2C 55 C0       347             BIT   TXTPAGE2
CE74:20 A3 CE       348             JSR   D048
CE77:2C 54 C0       349             BIT   TXTPAGE1
CE7A:B1 28          350             LDA   (BASL),Y
CE7C:20 A3 CE       351             JSR   DD48
CE7F:C0 28          352             CPY   #40
CE81:90 EC    CE6F  353             BCC   FORATE1
CE83:               354 *
CE83:20 91 CE       355             JSR   CLRHALF     ;CLEAR RIGHT HALF
CE86:2C 55 C0       356             BIT   TXTPAGE2    ; OF BOTH PAGES
CE89:20 91 CE       357             JSR   CLRHALF
CE8C:2C 54 C0       358             BIT   TXTPAGE1
CE8F:28             359             PLP               ;OK TO ALLOW IRQ NOW
CE90:60             360             RTS
CE91:               361 *
CE91:         CE91  362 CLRHALF     EQU   *
CE91:A0 14          363             LDY   #20
CE93:A9 A0          364             LDA   #' '
CE95:24 32          365             BIT   INVFLG      ;WHICH MODE?
CE97:30 02    CE9B  366             BMI   CLRHALF2    ;=>NORMAL
CE99:29 7F          367             AND   #$7F        ;INVERSE
CE9B:         CE9B  368 CLRHALF2    EQU   *
CE9B:91 28          369             STA   (BASL),Y    ;STUFF THE BLANK
CE9D:C8             370             INY
CE9E:C0 28          371             CPY   #40
CEA0:D0 F9    CE9B  372             BNE   CLRHALF2
CEA2:60             373             RTS
CEA3:               374 *
CEA3:48             375 D048        PHA
CEA4:98             376             TYA
CEA5:4A             377             LSR   A
CEA6:A8             378             TAY
CEA7:68             379             PLA
CEA8:91 28          380             STA   (BASL),Y
CEAA:E6 2B          381             INC   BAS2H
CEAC:A4 2B          382             LDY   BAS2H
CEAE:60             383             RTS
CEAF:                14             INCLUDE SUBS3
CEAF:                 2 ----------------------------------------
CEAF:                 3 * NAME     : SETCH
CEAF:                 4 * FUNCTION: SET OURCH AND CH
CEAF:                 5 * INPUT    : AC=CH VALUE
CEAF:                 6 * OUTPUT   : OURCH, CH AND 40
CEAF:                 7 * VOLATILE: NOTHING
CEAF:                 8 * CALLS    : NOTHING
CEAF:                 9 ----------------------------------------
CEAF:                10 *
CEAF:         CEAF   11 SETCH       EQU   *
CEAF:8D 7B 05        12             STA   OURCH       ;STUFF OURCH
CEB2:85 24           13             STA   CH          ;STUFF IN CASE WE'RE 40 MODE
CEB4:8D 7B 04        14             STA   OLDCH
CEB7:2C 1F C0        15             BIT   RDB0VID     ;IN 80-MODE?
CEBA:10 1D    CED9   16             BPL   SETCHRTS    ;=>NO, DONE
CEBC:                17 *
CEBC:                18 * IF WE'RE NEAR THE END OF OUR
CEBC:                19 *  80COL LINE, MOVE CH UP. IF NOT,
CEBC:                20 *  LEAVE CH PINNED AT ZERO...
CEBC:                21 *
CEBC:A9 00           22             LDA   #0          ;PIN CH AT ZERO
CEBE:85 24           23             STA   CH
CEC0:8D 7B 04        24             STA   OLDCH       ;REMEMBER THE SETTING
CEC3:A5 21           25             LDA   WNDWDTH     ;CHECK IF NEAR THE END
CEC5:38              26             SEC
CEC6:ED 7B 05        27             SBC   OURCH       ;GET ABS CH
CEC9:C9 08           28             CMP   #8          ;NEAR THE END?
CECB:B0 0C    CED9   29             BCS   SETCHRTS    ;=>NOPE
CECD:85 24           30             STA   CH          ;YES, MOVE CH UP NEAR RIGHT
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CECF A9 28          31              LDA   #4D
CED1: 38            32              SEC
CED2: E5 24         33              SBC   CH
CED4: 85 24         34              STA   CH            ;BASIC WILL SEE THAT NOW
CED6 8D 7B 04       35              STA   OLDCH         ;REMEMBER THE SETTING
CED9:               36 *
CED9:         CED9  37 SETCHRTS     EQU   *
CED9: AD 7B 05      38              LDA   OURCH         ;RESTORE AC
CEDC: 60            39              RTS
CEDD.               40 ----------------------------------------
CEDD:               41 * NAME       INVERT
CEDD                42 * FUNCTION   INVERT CHAR AT CH/CV
CEDD                43 * INPUT      NOTHING
CEDD                44 * OUTPUT     CHAR AT CH/CV INVERTED
CEDD                45 * VOLATILE   NOTHING
CEDD                46 * CALLS      PICK, STORCHAR
CEDD                47 ----------------------------------------
CEDD.               48 *
CEDD          CEDD  49 INVERT       EQU   *
CEDD 48             50              PHA                 ;SAVE AC
CEDE 98             51              TYA                 ; AND Y
CEDF. 48            52              PHA
CEE0: AC 7B 05      53              LDY   OURCH         ;GET CH
CEE3: 20 01 CF      54              JSR   PICK          ;GET CHARACTER
CEE6: 49 80         55              EOR   #$80          ;FLIP INVERSE/NORMAL
CEE8: 2C 00 CF      56              BIT   SEV           ;PUT DIRECTLY BACK
CEEB. 20 06 CF      57              JSR   SCREENIT      ; ONTO SCREEN
CEEE: 68            58              PLA                 ;RESTORE Y
CEEF A8             59              TAY                 ; AND AC
CEF0. 68            60              PLA
CEF1. 60            61              RTS
CEF2:               62 ----------------------------------------
CEF2:               63 * NAME     . STORCHAR
CEF2.               64 * FUNCTION. STORE A CHAR ON SCREEN
CEF2                65 * INPUT    : AC=CHAR
CEF2.               66 *          .  Y=CH POSITION
CEF2:               67 * OUTPUT   : CHAR ON SCREEN
CEF2                68 * VOLATILE: NOTHING
CEF2                69 * CALLS    . SCREENIT
CEF2.               70 ----------------------------------------
CEF2:               71 *
CEF2          CEF2  72 STORCHAR     EQU   *
CEF2. 48            73              PHA                 ;SAVE AC
CEF3: 24 32         74              BIT   INVFLG        ;NORMAL OR INVERSE?
CEF5: 30 02   CEF9  75              BMI   STOR2         ;=>NORMAL
CEF7: 49 8D         76              EOR   #$80          ;INVERSE
CEF9          CEF9  77 STOR2        EQU   *
CEF9: 2C DD CF      78              BIT   SEV           ;V SET FOR STORE
CEFC. 20 06 CF      79              JSR   SCREENIT      ;=>DO IT!
CEFF: 68            80              PLA                 ;RESTORE AC
CF0D: 6D            81 SEV          RTS
CF01.               82 ----------------------------------------
CFD1:               83 * NAME     . PICK
CF01.               84 * FUNCTION  GET A CHAR FROM SCREEN
CF01.               85 * INPUT    : Y=CH POSITION
CF01:               86 * OUTPUT   : AC=CHARACTER
CF01.               87 * VOLATILE: NOTHING
CF01:               88 * CALLS    . SCREENIT
CF01:               89 ----------------------------------------
CF01:               90 *
CF01:         CF01  91 PICK         EQU   *
CFD1: B8            92              CLV                 ;V CLEAR FOR PICK
CF02: 20 06 CF      93              JSR   SCREENIT      ;DO IT!
CF05: 60            94              RTS
CFD6:               95 ----------------------------------------
CF06:               96 * NAME     : SCREENIT
CFD6:               97 * FUNCTION: STORE OR PICK CHAR
CF06:               98 * INPUT    : V CLR FOR PICK
CF06.               99 *          : V SET FOR STORE
CF06.              100 *          : AC=CHAR FOR STORE
CFD6:              101 *          :  Y=CH POSITION
CFD6:              102 * OUTPUT   . AC=CHAR (PICK)
CFD6:              103 * VOLATILE: NOTHING
CFD6:              104 * CALLS    . NOTHING
CF06:              105 ----------------------------------------
CFD6:              106 *
CF06:         CF06 107 SCREENIT     EQU   *
CF06: 84 1F        108              STY   YSAV1         ;SAVE Y
CF08: 48           109              PHA                 ;SAVE CHARACTER IF STORING
CF09:              110 * AVOID CHANGING VFLAG VIA BIT!
CF09: AD 1F CD     111              LDA   RD80VID       ;WHAT DISPLAY MODE?
CF0C: 10 32   CF40 112              BPL   SCRN40        ;=>40-COL MODE
CFDE:              113 *
CFDE:              114 * 80-COLUMN MODE:
CFDE:              115 *
CF0E: A5 1F        116              LDA   YSAV1         ;GET CURSOR HORIZ
CF1D: 4A           117              LSR   A             ;DIVIDE BY TWO FOR PAGE
CF11: A8           118              TAY                 ;CH TO YREG
CF12: 70 16   CF2A 119              BVS   STOR80        ;=>GONNA STORE THE CHAR
CF14:              120 *
CF14:              121 * 80-COL PICK:
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CF14:                   122 *
CF14:08                 123             PHP             ;LOCK INTERRUPTS WHILE
CF15:78                 124             SEI             ; SCREENHOLES ARE WRONG
CF16:AD 55 C0           125             LDA   TXTPAGE2  ;ASSUME PAGE 2 (EVENS)
CF19:90 03   CF1E       126             BCC   SCRN2     ;=>IT IS
CF1B:AD 54 C0           127             LDA   TXTPAGE1  ;ODOS GO TO PAGE1
CF1E:          CF1E     128 SCRN2       EQU   *
CF1E:B1 28              129             LDA   (BASL),Y  ;PICK THE CHARACTER
CF20:A8                 130             TAY             ;HOLD CHAR TEMPORARILY
CF21:AD 54 C0           131             LDA   TXTPAGE1  ;RESTORE PAGE1
CF24:28                 132             PLP             ; AND ALLOW IRQ AGAIN
CF25:68                 133             PLA             ;TRASH SAVED AC
CF26:98                 134             TYA
CF27:48                 135             PHA             ;MAKE CHAR GET RESTORED TO AC
CF28:50 24   CF4E       136             BVC   STPKEXIT  ;=>DONE (ALWAYS TAKEN)
CF2A:                   137 *
CF2A:          CF2A     138 STOR80      EQU   *
CF2A:68                 139             PLA             ;RESTORE CHARACTER
CF2B:48                 140             PHA             ;(LEAVE ON STACK)
CF2C:08                 141             PHP             ;LOCK INTERRUPTS WHILE
CF2D:78                 142             SEI             ; THE SCREENHOLES ARE WRONG
CF2E:48                 143             PHA             ;HOLD THE CHAR TEMPORARILY
CF2F:A0 55 C0           144             LDA   TXTPAGE2  ;ASSUME PAGE2 (EVENS)
CF32:90 03   CF37       145             BCC   SCRN3     ;=>IT IS
CF34:A0 54 C0           146             LDA   TXTPAGE1  ;ODOS GO TO PAGE1
CF37:          CF37     147 SCRN3       EQU   *
CF37:68                 148             PLA             ;GET CHAR TO BE STORED
CF38:91 28              149             STA   (BASL),Y  ;STUFF ONTO SCREEN
CF3A:AD 54 C0           150             LDA   TXTPAGE1  ;RESTORE PAGE1
CF3D:28                 151             PLP             ; AND ALLOW IRQ AGAIN
CF3E:70 0E   CF4E       152             BVS   STPKEXIT  ;=>DONE (ALWAYS TAKEN)
CF40:                   153 *
CF40:                   154 * 40-COLUMN MODE:
CF40:                   155 *
CF40:          CF40     156 SCRN40      EQU   *
CF40:A4 1F              157             LDY   YSAV1     ;GET CURSOR HORIZ
CF42:70 06   CF4A       158             BVS   STOR40    ;=>STORE IT
CF44:68                 159             PLA             ;TRASH SAVED CHAR
CF45:B1 28              160             LDA   (BASL),Y  ;PICK THE CHARACTER
CF47:48                 161             PHA             ;SAVE CHAR FOR RESTORE
CF48:50 04   CF4E       162             BVC   STPKEXIT  ;DONE (ALWAYS TAKEN)
CF4A:                   163 *
CF4A:          CF4A     164 STOR40      EQU   *
CF4A:68                 165             PLA             ;GET THE CHARACTER
CF4B:48                 166             PHA             ;(LEAVE ON STACK)
CF4C:91 28              167             STA   (BASL),Y  ;STUFF ONTO SCREEN
CF4E                    168 *
CF4E:          CF4E     169 STPKEXIT    EQU   *
CF4E:68                 170             PLA             ;RESTORE AC
CF4F:A4 1F              171             LDY   YSAV1     ;RESTORE Y
CF51:60                 172             RTS
CF52                    173 ------------------------------------
CF52                    174 * NAME     : ESCON
CF52:                   175 * FUNCTION: TURN ON 'ESCAPE' CURSOR
CF52:                   176 * INPUT    : NONE
CF52:                   177 * OUTPUT   : 'CHAR'=ORIGINAL CHAR
CF52:                   178 * VOLATELE: NOTHING
CF52                    179 * CALLS    : PICK,STORCHAR
CF52:                   180 ------------------------------------
CF52:                   181 *
CF52:          CF52     182 ESCON       EQU   *
CF52:48                 183             PHA             ;SAVE AC
CF53:98                 184             TYA             ; AND Y
CF54:48                 185             PHA
CF55:AC 7B 05           186             LDY   OURCH     ;GET CH
CF58:20 01 CF           187             JSR   PICK      ;GET ORIGINAL CHARACTER
CF5B:80 7B 06           188             STA   CHAR      ; AND REMEMBER FOR ESCOFF
CF5E:29 80              189             AND   #$80      ;SAVE NORMAL/INVERSE BIT
CF60:49 AB              190             EOR   #$AB      ;MAKE IT AN INVERSE '+'
CF62:4C 6E CF           191             JMP   ESCRET    ;RETURN VIA SIMILAR CODE
CF65:                   192 ------------------------------------
CF65:                   193 * NAME     : ESCOFF
CF65:                   194 * FUNCTION: TURN OFF 'ESCAPE' CURSOR
CF65:                   195 * INPUT    : 'CHAR'=ORIGINAL CHAR
CF65:                   196 * OUTPUT   : NONE
CF65:                   197 * VOLATILE: NOTHING
CF65:                   198 * CALLS    : STORCHAR
CF65                    199 ------------------------------------
CF65:                   200 *
CF65:          CF65     201 ESCOFF      EQU   *
CF65:48                 202             PHA             ;SAVE AC
CF66:98                 203             TYA             ; AND Y
CF67:48                 204             PHA
CF68:AC 7B 05           205             LDY   OURCH     ;GET CH
CF6B:AD 7B 06           206             LDA   CHAR      ;GET ORIGINAL CHARACTER
CF6E:          CF6E     207 ESCRET      EQU   *         ;USED BY ESCON
CF6E:2C 00 CF           208             BIT   SEV       ; AND PUT IT BACK
CF71:20 06 CF           209             JSR   SCREENIT  ;  EXACTLY AS IT WAS
CF74:68                 210             PLA             ;RESTORE Y
CF75:A8                 211             TAY
CF76:68                 212             PLA             ; AND AC
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CF77:60             213              RTS
CF78:               214 ----------------------------------------
CF78:               215 * NAME     : COPYROM
CF78:               216 * FUNCTION: COPY F8 ROM TO LCARD
CF78:               217 * INPUT    : NOTHING
CF78:               218 * VOLATILE: X,Y
CF78:               219 * CALLS    : NOTHING
CF78:               220 ----------------------------------------
CF78:               221 *
CF78:        CF78   222 COPYROM      EQU   *
CF78:48             223              PHA                 ;SAVE AC
CF79:08             224              PHP                 ;ENSURE IRQ INHIBITED
CF7A:78             225              SEI                 ; WHILE COPYING ROM
CF7B:               226 *
CF7B:AD 11 CD       227              LDA   RDLCBNK2      ;GET BANK2
CF7E:48             228              PHA
CF7F:               229 *
CF7F:AE 12 C0       230              LDX   RDLCRAM       ; AND RAM FLAGS
CF82:AD 81 CD       231              LDA   $CD81         ;SET READ-ROM
CF85:AD 81 CD       232              LDA   $C081         ; WRITE-RAM MODE
CF88:               233 *
CF88:AD DD          234              LDY   #D
CF8A:A9 F8          235              LDA   #$F8
CF8C:85 37          236              STA   CSWH          ;USE HOOK FOR MOVE
CF8E:A5 36          237              LDA   CSWL          ;PRESERVE LO BYTE
CF9D:48             238              PHA
CF91:A9 OD          239              LDA   #D
CF93:85 36          24D              STA   CSWL
CF95:        CF95   241 COPYROM2     EQU   *             ;COPY ONLY PATCHED PAGES
CF95:B1 36          242              LDA   (CSWL),Y      ;MOVE THE ROM
CF97:91 36          243              STA   (CSWL),Y
CF99:C8             244              INY
CF9A:DO F9   CF95   245              BNE   COPYROM2
CF9C:E6 37          246              INC   CSWH
CF9E:DO F5   CF95   247              BNE   COPYROM2
CFAD:               248 *
CFA0:68             249              PLA                 ;RESTORE THE
CFA1:85 36          25D              STA   CSWL          ; HOOK
CFA3:A9 C3          251              LDA   #<CNDD
CFA5:85 37          252              STA   CSWH
CFA7:               253 *
CFA7:68             254              PLA                 ;WHICH LC BANK?
CFA8:10 DF   CFB9   255              BPL   LC81          ;=>BANK1
CFAA:8A             256              TXA                 ;RAM OR ROM READ?
CFAB:10 06   CFB3   257              BPL   LCB2ROM       ;=>ROM
CFAD:AD 80 CD       258              LDA   $CD8D         ;BANK2,RAM
CFBD:4C C5 CF       259              JMP   COPYRET
CFB3:AD 81 C0       260 LCB2ROM      LDA   $CD81         ;BANK2,ROM
CFB6:4C C5 CF       261              JMP   COPYRET
CFB9:8A             262 LCB1         TXA                 ;RAM OR ROM READ?
CFBA:10 06   CFC2   263              BPL   LCB1ROM       ;=>ROM
CFBC:AD 88 C0       264              LDA   $C088         ;BANK1,RAM
CFBF:4C C5 CF       265              JMP   COPYRET
CFC2:AD 89 CD       266 LCB1ROM      LDA   $CD89         ;BANK1,ROM
CFC5:               267 *
CFC5:        CFC5   268 COPYRET      EQU   *
CFC5:28             269              PLP                 ;RESTORE IRQ STATE NOW
CFC6:68             270              PLA                 ;  AND AC
CFC7:60             271              RTS
CFC8:               272 ----------------------------------------
CFC8:               273 * NAME     : PSETUP
CFC8:               274 * FUNCTION: SETUP ZP FOR PASCAL
CFC8:               275 * INPUT    : NONE
CFC8:               276 * OUTPUT   : NONE
CFC8:               277 * VOLATILE: AC
CFC8:               278 * CALLS    : NOTHING
CFC8:               279 ----------------------------------------
CFC8:               28D *
CFC8:        CFC8   281 PSETUP       EQU   *
CFC8:AD FB 04       282              LDA   MODE          ;TRANSPARENT MODE?
CFCB:29 01          283              AND   #M.TRANS
CFCD:DO D3   CFD2   284              BNE   PSETUP2       ;=>YES, TRUST WINDOW
CFCF:20 9B CD       285              JSR   FULL80        ;SET FULL 80COL WINDOW
CFD2:               286 *
CFD2:        CFD2   287 PSETUP2      EQU   *
CFD2:A9 FF          288              LDA   #255
CFD4:85 32          289              STA   INVFLG        ;ASSUME NORMAL MODE
CFD6:               29D *
CFD6:AD FB 04       291              LDA   MODE
CFD9:29 04          292              AND   #M.VMODE
CFDB:FD D2   CFDF   293              BEQ   PSETUPRET     ;=>IT'S NORMAL
CFDD:46 32          294              LSR   INVFLG        ;MAKE IT INVERSE
CFDF:               295 *
CFDF:        CFDF   296 PSETUPRET    EQU   *
CFDF:AD 7B D7       297              LDA   OLDBASL       ;SET UP BASE ADDRESS
CFE2:85 28          298              STA   BASL
CFE4:AD F8 D7       299              LDA   OLDBASH
CFE7:85 29          30D              STA   BASH
CFE9:6D             301              RTS
CFEA:               3D2 ----------------------------------------
CFEA:               303 * NOTE: ENTRIES 6-7 OF THESE TABLES
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```
CFEA:                 3D4 *  ARE NOT USED.  THUS THERE ARE
CFEA:                 3D5 *  SOME OTHER VALUES STUFFED IN.
CFEA:                 3D6 *
CFEA: 2B              307 F.TABLE     DFB   >F.CLREOP-1
CFEB: 42              308             DFB   >F.HOME-1
CFEC: 4C              309             DFB   >F.SCROLL-1
CFED: 7C              310             DFB   >F.CLREOL-1
CFEE: 9B              311             DFB   >F.CLEDLZ-1
CFEF: E9              312             DFB   >B.RESET-1  ;USE SAME RESET
CFF0: FF 01           313 PLUSMINUS1  DFB   -1,1        ;SCROLL USES THIS
CFF2: B9              314             DFB   >F.SETWND-1
CFF3:                 315 *
CFF3: E0              316 B.TABLE     DFB   >B.CLREOP-1
CFF4: EC              317             DFB   >B.HOME-1
CFF5: CC              318             DFB   >B.SCRDLL-1
CFF6: D2              319             DFB   >B.CLREOL-1
CFF7: DB              320             DFB   >B.CLEDLZ-1
CFF8: E9              321             DFB   >B.RESET-1  ;USE SAME RESET
CFF9: 23 22           322 WNDTAB      DFB   WNDBTM,WNDTOP ;SCROLL USES THIS
CFFB: E6              323             DFB   >B.SETWND-1
CFFC: 00              324             DFB   0           ;AVOID CFFF PIPELINING
CFFD:          CFFD    15 ZZEND       EQU   *
```

80-Column Symbol Table, Sorted by Symbol

```
   3D A1H          3C A1L          3F A2H          3E A2L
   43 A4H          42 A4L        CE13 ATEFDR1      CE0A ATEFOR
 CA02 B.CANLIT   C9DF B.CHKCAN   C1D9 B.CLEOLZ     C1D3 B.CLREOL
 C1E1 B.CLREOP   C26E B.ESCFIX   C272 B.ESCFIX2    C27A B.ESCFIX3
 CA0A B.FIXCHR   C9F7 B.FLIP     C1A4 B.FUNC0      C10E B.FUNCNE
?C100 B.FUNC     C211 B.FUNC1    C107 B.FUNCNK     C20E B.GETCH
 C1E0 B.HOME     C905 B.INPUT    CA24 B.INRET      C288 B.KEYIN
 C29C B.KEYIN2   C9C6 B.NOPICK   C11F B.OLDFUNC    C1EA B.RESET
 C234 B.RESETX   C1CD B.SCROLL   C221 B.SETWNO2    C219 B.SETWNDX
 C1E7 B.SETWNO   CFF3 B.TABLE    C1FF B.VECTOR       2B BAS2H
   2A BAS2L      CB54 BASCALCZ   CB51 BASCALC     CB7E BASCLC3
 CB97 BASCLCX      29 BASH       C317 BASICENT     C336 BASICENT2
 C803 BASICINIT  C305 BASICIN  ?C300 BASICINT    C307 BASICOUT
   28 BASL       CBC3 BELL2      C100 BFUNCPG      C831 BINIT1A
 CB16 BINIT1     CB50 BINIT2     CBF6 BINPUT       C8E2 BIORET
 C252 BLAST      CB96 BOUT       C8CC BPNCTL       C8A1 BPRINT
?CBE2 BS40       CB58 BSCLC1A    CB55 BSCLC1       CB60 BSCLC2
 CBEB BSDONE     C398 COI        C3A3 CO3          C874 C8B2
 C87E C8B3       C890 C8B4       C866 C8BASIC      07F8 C8SLOT
   24 CH         067B CHAR       CB50 CLEARIT      C181 CLEOL2
 C12D CLEOP1     C000 CLR80COL   C00C CLR80VID     C00E CLRALTCHAR
 CE9B CLRHALF2   CE91 CLRHALF    C300 CN00         CFC5 COPYRET
 CF95 COPYROM2   CF78 CDPYROM      37 CSWH         C836 CSWL
 CC7B CTLAOH     CC5F CTLAOL     CB99 CTLCHAR      CBAB CTLCHARX
 CBAE CTLGO      CBB2 CTLRET     CBB6 CTLXFER        25 CV
 C261 DIAGS      CEA3 DO48       C929 ESC1         C928 ESC2
 C935 ESC3       C918 ESCAPING   C983 ESCCHAR      C280 ESCIN
 C960 ESCNONE    0011 ESCNUM     CF65 ESCOFF       CF52 ESCON
 C284 ESCOUT     CF6E ESCRET     C945 ESCSPEC      C954 ESCSPEC2
 C963 ESCSPEC3   C972 ESCTAB   ?FBC1 F.BASCALC     C19C F.CLEOLZ
 C17D F.CLREOL   C129 F.CLREOP   C1A1 F.GORET       C143 F.HOME
 C2FI F.RET1     C2EB F.RETURN   C14D F.SCROLL     C1BA F.SETWND
 CFEA F.TABLE    FC22 F.VTAB     FC24 F.VTABZ      FBB3 FBVERSION
 CE6F FORATE1    CE63 FORATE     CD9B FULLB0       FD29 FUNCEXIT
 CE22 GETS4      CB1B GETK2      CB15 GETKEY       CA27 GETPRIOR
 CAAF GETY       C22E GOBACK       06 GOOOFB       C27D GORETN
 C2B5 GOTKEY     CA49 GPX        CB13 HANG         C2CC IK1
 C2D5 IK2A       C2CE IK2        C2DB IK3          CE0D INVERT
   32 INVFLG     FF58 IORTS      C348 JBASINIT     C34B JPINIT
 C351 JPREA0     C35D JPSTAT     C357 JPWRITE      C010 KBDSTRB
 C000 KBD        C8B4 KBDWAIT    C2EA KDRET      ?C2E6 KDRETN
 C2E9 KDRETY     C2C6 KEYDLY       39 KSWH         38 KSWL
 CFB9 LCB1       CFC2 LCB1RDM    CFB3 LCB2ROM        40 M.BINPUT
   B0 M.ESCR       08 M.GOXY       01 M.IRG        10 M.LIT
   02 M.PAS1.0     20 M.PASCAL     01 M.TRANS      04 M.VMODE
 04FB MODE       C378 MOVEC2M    C3B0 MOVELOOP     C3AC MOVERET
 C37E MOVESTRT   C363 MOVE       CC0D MBCRLO       CCE1 MSCRL1
 CCF9 MSCRL2     CD02 MSCRLRET   CD10 MBCRLRTS     C9B7 NOESC
 C1C5 NOI        C8C0 NDWAIT     C3BA NXTAI        07FB OLDBASH
 077B OLDBASL    047B OLDCH      CD09 ONEMORE      057B OURCH
 05FB OURCV      CF01 PICK       CA62 PIGOOD       CA4A PINITI.0
 CA51 PINIT2     CA4F PINIT      CFF0 PLUSMINUS1   CA74 PREAD
 CA8A PREADRET2  CFD2 PSETUP2    CFC8 P8ETUP       CFDF PSETUPRET
 C99E PSTATUS2   C994 PSTATUS    C9B0 PSTATUS3     C9B4 PSTATUS4
?CA9E PWRITE2    CACB PWRITE3    CABE PWRITE       CAEB PWRITE4
 CB0F PWRITERET  CB09 PWWRAP     CDC0 QUIT2        C0AA QUIT
 C01B RDB0COL    C01F RDB0VIO    C003 RDCARORAM   ?FD0C ROKEY
 C011 RDLCBNK2   C012 RDLCRAM    C002 RDMAINRAM    C01C RDPAGE2
 C013 RDRAMRD    C014 RDRAMWRT   C01A RDTEXT     ?C019 RDVBLBAR
 C264 RESETRET     4F RNDH         4E RNDL         CE01 SCR40RET
 CDEA SCR40      CE3E SCRB0      CE55 SCRBORET     CF06 SCREENIT
 C153 SCRL1      C169 SCRL2      C172 SCRL3        CCD1 SCRLSUB
 CF1E SCRN2      CF37 SCRN3      CF40 SCRN40       CE32 SCRN4S
 CDDB SCRNS4     CE5S SCRNRET    CCAE SCROLL1      CCBS BCRDLL2
 CCAA SCRDLLDN   CCA4 SCROLLUP   C001 SETB0COL     C00D SETB0VIO
 C00F BETALTCHAR C009 SETALTZP   C3EB SETC8        CEAF SETCH
 CED9 BETCHRTS ?C007 SETINTCXRDM FE89 SETKBD       C00B SETSLOTC3ROM
 C008 SETSTDZP   FE93 SETVID     CF00 SEV          FC75 SNIFFIRQ
 C030 SPKR       CADC STARTXY    CB48 STAY80       C84D STAY80
 CEF9 STOR2      CF4A STOR40     CF2A STORB0       CEF2 STDRCHAR
 CF4E BTPKEXIT   CC59 BTUFFINV   0478 TEMP1          00 TEST
 CB24 TESTCARD ?CB4E TESTFAIL    C054 TXTPAGE1     C055 TXTPAGE2
 CBCF WAIT       CBD0 WAIT2      CBD1 WAIT3          23 WNDBTM
   20 WNDLFT     CFF9 WNDTAB       22 WNDTOP       21 WNDWDTH
 C005 WRCARDRAM  C004 WRMAINRAM  CBBC X.BELL       CBDB X.BS
 C2F6 X.CLEOL2   C2F4 X.CLEOLZ   CC0C X.CRRET      CBEC X.CR
```

```
 CBFD X.CRPAS        CD64 X.DC1B         CD76 X.DC1RTS       CD59 X.DC1
 CD88 X.DC2B         CD9A X.DC2RET       CD77 X.DC2          CC0D X.EM
 CD42 X.FF           CC33 X.FSRET        CC26 X.FS           CD48 X.GS
 CD54 X.GS2          CD4E X.GSEOLZ       CC91 X.LF           CC9E X.LF2
 CD20 X LFRET        CD90 X.NAK          CD9A X NAKRET       CD11 X.SCRLRET
 CD17 X.SCRLRET2     CC92 X.SI           CC49 X.SO          ?CC1D X SUBB0
 CC1F X SUBLP        CC1A X.SUB          CC34 X.US           CC40 X.US1
 CC45 X.US2          CC48 X.USRET        CD23 X.VT           CD2C X.VTLODP
 CD32 X.VTNEXT       06FB XCODRD         C3B0 XFER           C3CD XFERAZP
 C3C5 XFERC2M        C3DC XFERSZP          1F YSAV1          ?  02 ZSPAREC2
?CFFD ZZEND
** SUCCESSFUL ASSEMBLY  = NO ERRORS
** ASSEMBLER CREATED ON 05-JAN-82 000004
** TOTAL LINES ASSEMBLED  2419
** FREE SPACE PAGE COUNT   49
    2  EQUATES
    3  BFUNC
    4  C3SPACE
    5  CBSPACE
    6  BPRINT
    7  BINPUT
    8  PINIT
    9  PREAD
   10  PWRITE
   11  SUBS1
   12  SUBS2
   13  SUBS3
```

80-Column Symbol Table, Sorted by Address

```
   00 TEST          01 M.TRANS       01 M.IRQ         02 M.PAS1.D
?  02 ZSPAREC2      04 M.VMODE       06 GBBBFB        08 M.GBXY
   10 M.LIT         0011 ESCNUM      1F YSAV1         20 M.PASCAL
   20 WNDLFT        21 WNDWDTH       22 WNBTOP        23 WNBBTM
   24 CH            25 CV            28 BASL          29 BASH
   2A BAS2L         2B BAS2H         32 INVFLG        36 CSWL
   37 CSWH          3B KSWL          39 KSWH          3C A1L
   3D A1H           3E A2L           3F A2H           40 M.BINPUT
   42 A4L           43 A4H           4E RNBL          4F RNBH
   B0 M.ESCR        0478 TEMP1       047B BLOCH       04FB MBBE
 057B BURCH         05FB OURCV       067B CHAR        06FB XCBORB
 077B OLDBASL       07FB CBSLBT      C000 KBD         C000 CLRBOCBL
 C000 KBD           C001 SETBOCBL    C002 RBMAINRAM   C003 RBCARDRAM
 C004 WRMAINRAM     C005 WRCARBRAM   ?C007 SETINTCXROM C008 SETSTBZP
 C009 SETALTZP      C00B SETSLBTC3RBM C00C CLRBOVIB   C00B SETBOVID
 C00E CLRALTCHAR    C00F SETALTCHAR  C010 KBDSTRB     C011 RBLCBNK2
 C012 RDLCRAM       C013 RBRAMRB     C014 RBRAMWRT    C018 RBBOCOL
?C019 RDVBLBAR      CD1A RBTEXT      C01C RDPAGE2     C01F RBBOVID
 C030 SPKR          C054 TXTPAGE1    C055 TXTPAGE2    ?C100 B.FUNC
 C100 BFUNCPG       C107 B.FUNCNK    C10E B.FUNCNE    C11F B.OLDFUNC
 C129 F.CLREOP      C12D CLEBP1      C143 F.HBME      C14B F.SCROLL
 C153 SCRL1         C169 SCRL2       C172 SCRL3       C17D F.CLREBL
 C181 CLEOL2        C18A F.SETWNB    C19C F.CLEDLZ    C1A1 F.QBRET
 C1A4 B.FUNCO       C1C5 NOI         C1CB B.SCRDLL    C1D3 B.CLREBL
 C1D9 B.CLEOLZ      C1E1 B.CLREOP    C1E7 B.SETWND    C1EA B.RESET
 C1ED B.HOME        C1FF B.VECTBR    C20E B.GETCH     C211 B.FUNC1
 C219 B.SETWNBX     C221 B.SETWND2   C22E GBBACK      C234 B.RESETX
 C252 BLAST         C261 BIAGS       C264 RESETRET    C26E B.ESCFIX
 C272 B.ESCFIX2     C27A B.ESCFIX3   C27B QBRETN      C2B0 ESCIN
 C2B4 ESCBUT        C2B8 B.KEYIN     C29C B.KEYIN2    C2B5 GOTKEY
 C2C6 KEYDLY        C2CC IK1         C2CE IK2         C2B5 IK2A
 C2D8 IK3          ?C2E6 KBRETN      C2E9 KBRETY      C2EA KBRET
 C2EB F.RETURN      C2F1 F.RET1      C2F4 X.CLEDLZ    C2F6 X.CLEBL2
 C300 CNOO         ?C300 BASICINT    C305 BASICIN     C307 BASICOUT
 C317 BASICENT      C336 BASICENT2   C348 JBASINIT    C34B JPINIT
 C351 JPREAB        C357 JPWRITE     C35B JPSTAT      C363 MOVE
 C37B MOVEC2M       C37E MOVESTRT    C380 MOVELOBP    C3BA NXTA1
 C37B CO1           C3A3 CO3         C3AC MBVERET     C3B0 XFER
 C3C5 XFERC2M       C3CB XFERAZP     C3BC XFERSZP     C3EB SETCB
 C803 BASICINIT     CB13 HANG        CB16 BINIT1      CB31 BINIT1A
 CB50 BINIT2        CB5D CLEARIT     CB66 CBBAS1C     CB74 CBB2
 CB7E CBB3          CB90 CBB4        CB96 BOUT        CBA1 BPRINT
 CBB4 KBOWAIT       CBCO NOWAIT      CBCC BPNCTL      CBE2 BIORET
 CBF6 BINPUT        C905 B.INPUT     C918 ESCAPING    C929 ESC1
 C92B ESC2          C935 ESC3        C945 ESCSPEC     C954 ESCSPEC2
 C960 ESCNONE       C963 ESCSPEC3    C972 ESCTAB      C9B3 ESCCHAR
 C994 PSTATUS       C99E PBTATUS2    C9B0 PSTATUS3    C9B4 PSTATUS4
 C9B7 NOESC         C9C6 B.NOPICK    C9BF B.CHKCAN    C9F7 B.FLIP
 CA02 B.CANLIT      CA0A B.FIXCHR    CA24 B.INRET     CA27 GETPRIOR
 CA49 GPX           CA4A PINIT1.0    CA4F PINIT       CA51 PINIT2
 CA62 PIGOOB        CA74 PREAD       CA8A PREADRET2   CABE PWRITE
?CA9E PWRITE2       CAAF GETY        CACB PWRITE3     CADC STARTXY
 CAEB PWRITE4       CB09 PWWRAP      CB0F PWRITERET   CB15 GETKEY
 CB1B GETK2         CB24 TESTCARD    CB48 STAY2       CB4D STAYB0
?CB4E TESTFAIL      CB51 BASCALC     CB54 BASCALC2    CB55 BSCLC1
 CB5B BSCLC1A       CB6D BSCLC2      CB7E BASCLC3     CB97 BASCLCX
 CB99 CTLCHAR       CBAB CTLCHARX    CBAE CTLGO       CBB2 CTLRET
 CBB6 CTLXFER       CBBC X.BELL      CBC3 BELL2       CBCF WAIT
 CBDO WAIT2         CBD1 WAIT3       CBDB X.BS       ?CBE2 BS40
 CBEB BSOONE        CBEC X.CR        CBFD X.CRPAS     CC0C X.CRRET
 CC0D X.EM          CC1A X.SUB      ?CC1D X.SUBBO     CC1F X.SUBLP
 CC26 X.FS          CC33 X.FSRET     CC34 X.US        CC4D X.US1
 CC45 X.US2         CC4B X.USRET     CC49 X.SD        CC52 X.SI
 CC59 STUFFINV      CC5F CTLAOL      CC7B CTLAOH      CC91 X.LF
 CC9E X.LF2         CCA4 SCROLLUP    CCAA SCROLLON    CCAE SCROLL1
 CCB8 SCROLL2       CCD1 SCRLSUB     CCOB MSCRLO      CCE1 MSCRL1
 CCF9 MSCRL2        CCD2 MSCRLRET    CDD9 ONEMORE     CD10 MSCRLRTS
 CD11 X.SCRLRET     CD17 X.SCRLRET2  CB20 X.LFRET     CD23 X.VT
 CD2C X.VTLOOP      CD32 X.VTNEXT    CB42 X.FF        CD48 X.GS
 CD4E X.GSEOLZ      CD54 X.GS2       CB59 X.OC1       CD64 X.OC1B
 CD76 X.OC1RTS      CD77 X.DC2       CB88 X.OC2B      CD90 X.NAK
 CB9A X.NAKRET      CD9A X.BC2RET    CB9B FULLBO      CDAA QUIT
 CDCO QUIT2         CBOB SCRNB4      CBEA SCR4O       CED1 SCR4ORET
 CE0A ATEFOR        CE13 ATEFOR1     CE22 GETB4       CE32 SCRN4B
 CE3E SCRBO         CE55 SCRBORET    CE5B SCRNRET     CE63 FORATE
 CE6F FORATE1       CE91 CLRHALF     CE9B CLRHALF2    CEA3 DD4B
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 CEAF SETCH          CED9 SETCHRTS       CEDD INVERT         CEF2 STORCHAR
 CEF9 STOR2          CF00 SEV            CF01 PICK           CF06 SCREENIT
 CF1E SCRN2          CF2A STORBO         CF37 SCRN3          CF40 SCRN40
 CF4A STOR40         CF4E STPKEXIT       CF52 ESCON          CF65 ESCOFF
 CF6E ESCRET         CF78 COPYROM        CF95 COPYROM2       CFB3 LCB2ROM
 CFB9 LCB1           CFC2 LCB1RDM        CFC5 COPYRET        CFCB PSETUP
 CFD2 PSETUP2        CFDF PSETUPRET      CFEA F.TABLE        CFF0 PLUSMINUS1
 CFF3 B.TABLE        CFF9 WNDTAB        ?CFFD ZZEND          FBB3 FBVERSION
?FBC1 F.BASCALC      FC22 F.VTAB         FC24 F.VTABZ        FC75 SNIFFIRQ
?FD0C RDKEY          FD29 FUNCEXIT       FE09 SETKBD         FE93 SETVID
 FF58 IORTS
** SUCCESSFUL ASSEMBLY := NO ERRORS
** ASSEMBLER CREATED ON 05-JAN-82 000004
** TOTAL LINES ABBEMBLED  2421
** FREE SPACE PAGE COUNT   49
    2  EQUATES
    3  BFUNC
    4  C3SPACE
    5  C8SPACE
    6  BPRINT
    7  BINPUT
    8  PINIT
    9  PREAD
   10  PWRITE
   11  SUBS1
   12  SUBS2
   13  SUBS3
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